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TYPES OF FARMING IN WEST VIRGINIA

by W. W. ARMENTROUT and T. D. JOHNSON

WEST VIRGINIA AGRICULTURAL EXPERIMENT STATION
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TYPES OF FARMING IN WEST VIRGINIA

by W. W. ARMENTROUT and T. D. JOHNSON[1]

INTRODUCTION

THE TERM "type of farming" refers to the kind and proportions of productive farm enterprises found on individual farms. Farms producing the same kinds of crops and keeping the same kinds of livestock or using their productive resources in a similar manner may be said to be following the same type of farming. A "type-of-farming area" therefore refers to an area in which farming, on the average, is carried on in a fairly high degree of uniformity as to kinds and proportions of enterprises.

The kind of farming found in any area is the result of the experience of farmers in adjusting their business to the physical and economic forces prevailing in the area.

This type of farming study of the State of West Virginia was undertaken in order to acquire an understanding of the agriculture of the state as a whole; to locate the different type-of-farming areas and to determine the character of farm types within these areas in terms of farm organizations, crop and livestock patterns, and sources of farm incomes; to identify and evaluate the relative importance of the physical and economic conditions which have been and are now shaping the types of farming in the various areas.

The sources of data upon which this study is based are reports of the Bureau of the Census, United States Department of Commerce; the Bureaus of Chemistry and Soils, Agricultural Economics, and Weather in the United States Department of Agriculture; the Geological Survey, Department of the Interior; the West Virginia State Geologist; the West Virginia Agricultural Experiment Station; and the West Virginia Agricultural Extension Service.

Income data for the 1929 crop year were used in delineating the type of farming areas and in portraying the sources of income of the various types of farms, because these income data are the only available which are broken down into county units. More recent income data for the state as a whole indicate little change in relative sources of income. In 1929, 44% of the gross farm income was derived from crops and 56% from livestock and livestock products, while in a more recent year (1935), 30% was derived from crops and 70% from livestock. If income data more recent than for 1929 were available they would probably indicate that there are a few more livestock farms of all kinds in the state than appears from the analysis in this publication. The gross farm income in the state in 1935 was only 65% of the 1929 income. Therefore, if 1935 income data were available by individual farms, the proportion of self-sufficing farms undoubtedly would be increased over that for 1929 as shown in this publication.

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HISTORICAL DEVELOPMENT OF WEST VIRGINIA AGRICULTURE

Until 1863, the land area included in the present State of West Virginia was a part of the State of Virginia. Primary differences in the agricultural development of the two sections of the original state were instrumental in causing their separation. The colonial agriculture of the Coastal Plain and Tidewater section of Virginia was developed around the plantation system of raising tobacco as the principal cash crop and using slaves as a source of labor, the farm land being owned and operated in relatively large holdings. The present area of the State of West Virginia was settled at a later period than much of the other part of Virginia. Settlement was mainly in the valleys, by independent White farmers, many of whom came from Pennsylvania and other northern states. The plantation system of slave labor did not fit into the agricultural economy because markets were too far distant or too difficult to reach, suitable farm land was limited in amount, and climatic conditions generally were not conducive to tobocco growing.

The roughness of the topography, the difficulties of transportation, the small areas of good crop land, and the inherited points of view and customs of the early settlers dictated in the beginning a self-sufficient type of agricultural economy for most areas of the state. The exceptions to this were in areas bordering the Ohio River and its Monongahela tributaries.

The lack of large areas of level land limited the number of settlers in any one local area. The comparatively level lands adjacent to the rivers and streams were settled and cleared first. Later the rougher lands were cleared, some of the timber being transported by water to market, but most of it was burned. Within a few years after the land was cleared the virgin soils in most sections fostered natural grass pastures, and the agriculture began to change into a pastoral type. The livestock could be driven to market.

With the penetration of railroads into the more inaccessible areas not served by water transportation and with markets for timber available in the growing cities of the state, lumbering became of major importance in bringing population to the remoter sections. Many small lumbering towns sprang up in all sections, but with the exhaustion of the virgin timber stands many of the people who came to work in the forests and mills were left to take up farming upon the cleared land.

The development of the oil industry in the Ohio Valley Basin in West Virginia was also of great importance in peopling that part of the state. By 1880 West Virginia was one of the foremost states in the production of petroleum, which became of importance in nearly all sections west of the Alleghany Plateau. By 1900 oil production had begun its decline, but the development of a commercial market for natural gas caused this resource to replace oil to a considerable extent as a source of income to the land owners in this area. The development of the bituminous coal fields in western Pennsylvania also gradually spread down through

West Virginia west of the high plateau, much of this section of the state being underlain with coal deposits of sufficient vein thickness to be mined economically.

With the exception of the Shenandoah River Valley, the South Branch Valley, the Greenbrier Valley, and the highest plateau section north of the Greenbrier Valley, practically all of the state has had an agricultural development more or less incidental to the development of the lumber, oil, gas, and coal industries. While major improvements were being made in the agriculture of the nation from 1880 to 1920, the agriculture in much of West Virginia was largely in a state of arrested development. The influx of populations caused by the lumber, oil, and gas industries and the subsequent decline in these industries has tended to leave a larger population dependent upon agriculture than otherwise might have been the case if the land had been settled originally only for agricultural purposes. Land has been devoted to agricultural uses even where the probable income was small, because the income from lumber, oil, and gas made up the difference. With a relatively small income remaining from these sources today, the occupants of the land in many sections are forced to get along on the limited income possible from agriculture alone. This has led to land uses not entirely consistent with conservation of soil or with good timber or pasture management. There is a tremendous pressure of population on the land, and low-income farmers abound.

FACTORS INFLUENCING THE AGRICULTURAL DEVELOPMENT OF WEST VIRGINIA

The type of farming and the methods and practices used in carrying on the farm operations are the results of the experiences of farmers in operating their farms under conditions and situations found in the area. After some years of trial and error the farmers learn by experience what crops can best be grown, what livestock can best be kept, and the combination of enterprises which appears to yield the most satisfactory economic returns under the conditions prevailing in the area. New and young farmers imitate their elders.

The factors which are primarily responsible for determining the types of farming may be placed in two categories—those physical and biological in nature and those economic in nature. The former is the less changing of the two and includes (a) land-surface features, (b) physical characteristics and productivity of soils, (c) length of growing season, (d) amount and distribution of rainfall, (e) drainage, and (f) plant and animal diseases and pests. Those factors economic in nature are subject to violent and often rapid change. They include such important things as (a) location of the area in relation to markets, (b) transportation facilities and costs, (c) relationship of costs and prices as between both enterprises and competing areas, and (d) characteristics of the population.

PHYSICAL FACTORS

Land-Surface Features.* The general roughness of the land surface of West Virginia is the most significant single factor determining its types of farming. The steepness of its slopes dictates a relatively small acreage of tilled crops produced in a large measure without the advantages of modern mechanical equipment and power. The extremely uneven topography over the entire state is indicated by Figure 1.

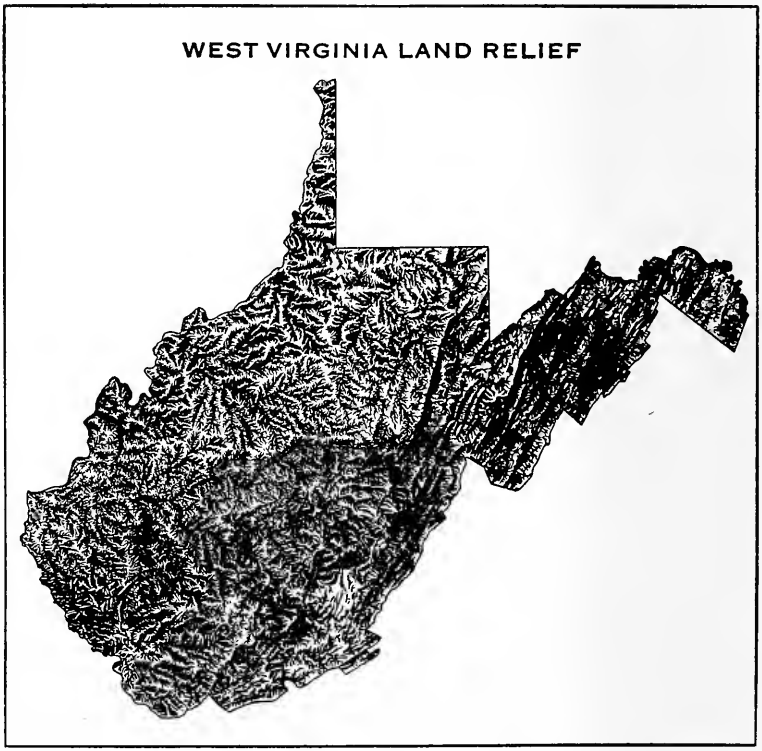

Figure 1

No large areas of level land are found in any section of the state. The most extensive areas of rolling to level land are in the Shenandoah Valley and in the lower Greenbrier Valley. West Virginia lies partly in the Cumberland Plateau, partly in the Alleghany Mountains and contiguous foothills and partly in the rolling to rough lands of the Ohio River Basin. No broad expanses of alluvial bottom lands are found either along the Ohio River or along any of the other large rivers in the state. On the Alleghany and Cumberland plateaus the land surface is steep. The land surface is rougher along many of the important rivers than it is away

*See W. Va. Agr. Exp. Sta. Bul. No. 284 for detailed discussion of slope.

from them, particularly along the Cheat, the New, and the Guyandot rivers.

The land surface in the northern and eastern sections, comprising about two-thirds of the state, is characterized by relatively long steep slopes with little or no flat land between, except perhaps a few hundred feet along the local stream. These slopes lead up to the tops of knobs and ridges, the tops usually having small areas of land less steep than the sides. On the average, the soil surface is not broken by rock outcropping, and the slopes are not too steep for cattle grazing. In the southern one-third of the state, however, except for the lower Greenbrier Valley, the slopes are steeper and shorter, culminating in narrow ridges and deep gullies. Very little land is level enough even for pasturing. From the north-central part of the state the land surface gets rougher as one goes west towards the Ohio River.

The wide variations in the slope of the land surface are indicated by

Land with a slope of 0 to 12% comprises only 16% of the total land area. The largest area within this range of slope is in the Shenandoah Valley in the Eastern Panhandle, but in the western half of the state this relatively level land is found only in narrow strips along streams. Parts of the level upland shown in the highland area of the state have a rocky soil of limited agricultural value.

Land with an average slope ranging from 12 to 25% makes up 18% of the total land area and is most abundant in the eastern half of the state. In general, much of this land has a relatively low productivity; but in many sections the absence of more level land makes it necessary that it be used for crops.

Land having an average slope between 25 to 40%, comprising 38% of the total land area, is most common in the pasture areas in the northern and western parts of the state. It is primarily suited for no more intensive use than pasture. However, in many local sections the absence of any more level land has caused some of this land to be used for the production of winter feed crops for livestock. A high percentage of the land in crops in these pasture areas is, therefore, in hay.

Generally speaking, land with a slope of over 40%, which comprises 28% of the land area of the state, is primarily suited only for forests. On the borders of the relatively good pasture areas, however, some of this steep land is in pasture.

The ruggedness of the land surface dictates a farm layout of the following general pattern: a majority of the farms contain varying quantities of land in each of the four slope categories; the bottom land along a stream and the bench land or relatively level land on the hill tops usually are used for crops; in areas where this level land makes up a larger proportion of the farm land than average, the crop acreage is greater than average; the pasture land on the average farm is the steeper land, and the land with a slope of over 40% usually remains in woods.

Elevation

The range in elevation in the state is wide, varying from less than 500 feet in the Eastern Panhandle to over 4,000 feet in the Alleghany Mountains. Very little agriculture, except limited livestock grazing, is carried on in elevations above 3,000 feet, and most of the best crop land lies in valleys having an elevation of less than 2,000 feet. Only in sections above 2,000 feet is elevation of importance in limiting crop production because of frosts, and corn is the only field crop commonly affected by the short growing season in the higher altitudes. The relatively cool average temperatures in the high lands are definitely favorable to potato and buckwheat production and are not unfavorable to the pasture grasses, grass hays, oats, and wheat.

The major effect of elevation on the type of farming in the state is through its influence on rainfall rather than on the length of growing season.

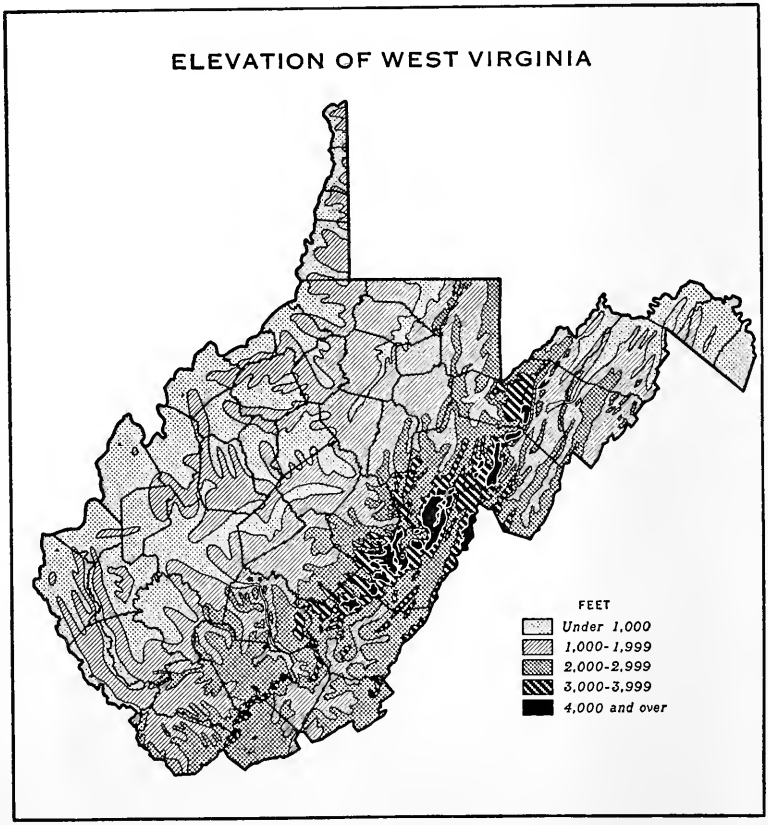

Figure 2

Soils*

The bottom land and terrace soils make up about 8% of the total acreage of the state. The upland soils, where limestone has had a considerable influence upon soil formation, comprise about 11% of the land area.† These limestone-influenced soils are found mainly in the Shenandoah, Potomac, Greenbrier, and Monongahela Valleys, in the Northern Panhandle, and in the small valleys in the Appalachian Highlands. The residual sandstone and shale soils make up about 81% of the soils of the state, including about 12% of rough stony land of no agricultural value. In many large areas, especially in the southern part of the state, these sandstone and shale soils are so rough as to be of little agricultural use. In general the most productive land is either the alluvial or residual limestone soils, with the sandstone and shale soils the least productive.

Although soil types in the state vary greatly in their inherent productivity, practically all the soils except the rough stony land have enough inherent fertility to warrant their use for agricultural purposes if topography permits. Many of the residual sandstone and shale soils, where they have sufficient depth, respond readily to good soil practices. In Preston County, for example, where these soils are found on less steep slopes than in any other large area in the state, a general type of cropping system prevails which is relatively productive.

Classes of Land

General classes of land prevailing in the various parts of the state are indicated in the Land-Classification Map.† These relative qualities of land were determined from the soil types, average slopes, and erosion conditions prevailing in the various areas.

As indicated by the map, superior crop land (Class I) is found only in the Shenandoah Valley, in narrow strips along the Ohio River, and in relatively small patches in the Greenbrier and South Branch valleys. It comprises about 1.5% of the total area of the state.

Good crop land (Class II) differs from the superior crop land in that the soils may have somewhat lower productivity, may be more severely eroded, or be on steeper slopes. Class II land makes up 2.3% of the total land area.

Average crop land (Class III) comprises about 3.4% of the land area and in general is made up of the non-limestone soils with a slope level enough for crop cultivation without danger of serious erosion. In this class are also some bottom land or terrace soils which need drainage. The total of Classes I, II, and III in general include the areas of the state where, under average conditions, crops may be grown without resulting in serious erosion and where average yields under normal circumstances would be relatively good. It is significant that these classes combined make up only 7.2% of the land area of the state.

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*See W. Va. Agr. Exp. Sta. Bul. 284 for detailed discussion of soils.

†Reference is made here to the General Soil Map and the General Land Classification Map in West Virginia Agricultural Experiment Station Bulletin 285, which is part of the present publication.

Class IV soils, which are below average crop land or good pasture land, make up 9.1% of the total land area. A considerable part of this land is composed of soils which are comparatively productive, but the slopes are too steep for best crop production. Some of the best pastures in the state are found on this class of land.

Land classed as inferior crop land or average pasture land (Class V) generally is too steep for crop production, and the soil types of only average fertility support poor pasture growth. It comprises 30.7% of the total. At present the sod is poor on these soils. They are unproductive but not unresponsive to treatments of lime and fertilizer.

The land classed as submarginal (Class VI) constitutes 20.5% of the total land area. This land is either too steep, too stony, or too shaly to be farmed with profit or without depletion. In these areas, in general, the plots of land which are suitable for agriculture are too small and too scattered to maintain a population supported by agriculture alone.

Land classed as forest land (Class VII) comprising 31.8% of the area of the state is mainly in forest at present and differs from Class VI in that even less of the land is suitable for agricultural uses. Some of the land is very steep, with practically no valley land between the ridges, and the soils are generally stony.

In using this land class map, it should be remembered that it is the result of generalizations of slopes, soils, and erosion data, and the boundaries of the respective areas are only approximations of where the average conditions change. Within any one local area exceptions can be definitely noted, and these land class groups apply only to an area as a whole. It should be noted also that this map indicates the uses to which land is primarily suited. Generally speaking, the use for which the land is suited primarily is the major use of that land at present. However, although most of the land in a county, such as Doddridge for example, may be suited only for pasture, the farm plans prevailing on livestock farms in that area must include some crop land for winter feed production. In the same manner, although some southern counties contain little land suited for any use except forests, there are found many farms mainly of a self-sufficient nature which are operated in spite of the extremely unfavorable physical conditions prevailing.

Land classes as indicated on this map are ranked according to their relative qualities within the state. Five classes of land are indicated as being suited primarily for agricultural purposes. The classification of soils on the basis of their productivity as advocated by the Bureau of Chemistry and Soils, United States Department of Agriculture, which includes classes from 1 to 10, would apply in general to this West Virginia classification, with each West Virginia class including two corresponding classes of the Bureau of Chemistry and Soils. Land classed as "superior" in West Virginia would rank either as 1 or 2 land in the United States classification. Some of the Ohio River alluvial bottoms and first bench land are Class 1 land on the basis of U. S. rating. The limestone soils in the Shenandoah Valley are Class 2 lands on the basis of relative inherent productivity for all U. S. Soils.

Soil Erosion*

With a large percentage of the land surface of the state on relatively steep slopes, and with abundant rainfall in most areas, the problem of soil erosion has been of major importance in determining the use to which farm land can be put. It is estimated (Soil Erosion Service) that only 10% of the land area of the state is subject to little or no soil erosion but that 64% has lost from 25 to 75% of the original topsoil, and 26% has lost more than 75% of the topsoil by erosion. The areas where erosion is most severe are in the northern and western parts of the state, where much of the land was originally cropped but later returned to pasture. The cropping of these steep slopes caused severe soil erosion, with attendant loss of fertility, and when it was returned to grass the poor cover in many sections was insufficient to check erosion effectively.

Even a reasonable arresting of soil erosion on farm land in the state requires constant diligence on the part of farmers because of the relative steepness of slopes. Practically all types of farm organization require some crop land in order to produce feed crops for livestock at least in the off-pasture season. Many farm boundaries do not include any reasonably level land, hence these crops must be grown on slopes where erosion may become serious. Although the crop land on farms is usually only a small percentage of the total farm land, in most instances it is the more productive, relatively level land. The loss, therefore, of this best land through erosion seriously handicaps the agriculture of an area.

The principal methods of soil conservation which seem to be practical in most sections of the state are briefly as follows: (1) growing a minimum acreage of erosive crops in rotation with erosion-resistant crops on the farm land least subject to erosion; (2) use of strip cropping, contour plowing, and cultivation; (3) use of lime and fertilizers to increase pasture cover; (4) use of terraces, contour furrows on pastures, diversion ditches, and other mechanical means of caring for water runoff. The extent to which soil conservation would be attained through any one or all of the above practices applied to the individual farm would depend upon the soil types, slopes, erosion, and type and size of farm.

Precipitation

In all areas in the state the normal rainfall, as shown in Figure 3, is sufficient to grow all general farm crops. Over most of the state the average yearly rainfall ranges between 40 and 49 inches. The area of lowest rainfall is east of the Alleghany Front, with a small area in Pendleton and Grant counties having less than 30 inches per year. The area of highest annual rainfall is in southwestern Randolph and southeastern Upshur counties, where it is more than 60 inches on the average. The relatively heavy rainfall in the higher altitudes, where a cool growing season prevails, is favorable to the growth of pasture grasses. East of the Alleghany Front in the areas of lowest rainfall pastures dry out and are less productive in the hot months than in the areas of heavier rainfall.

*Reference is made here to the General Slope Map in West Virginia Agricultural Experiment Station Bulletin 285, which is part of the present publication.

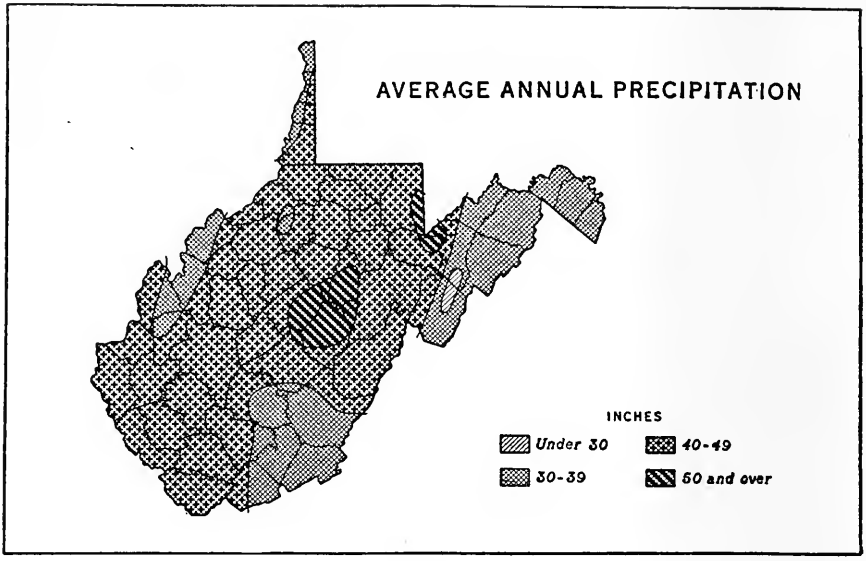

Figure 3

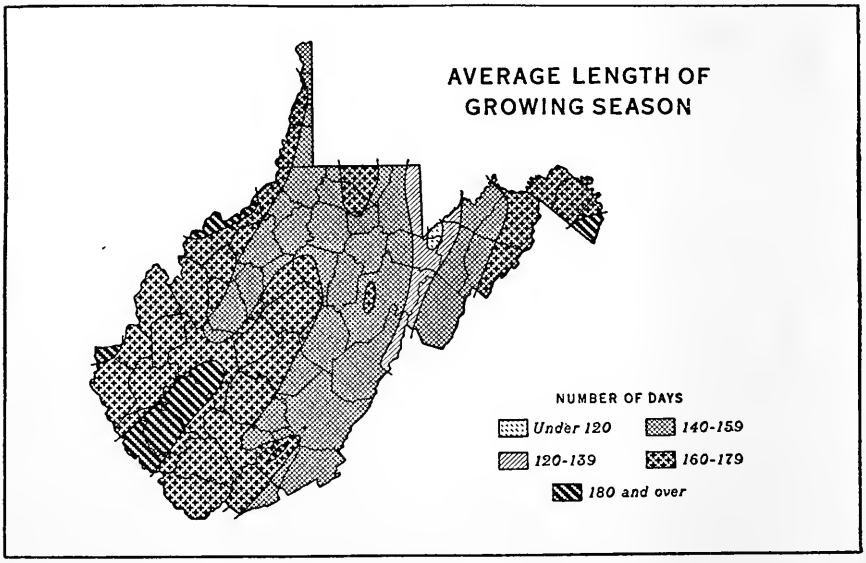

Figure 4

Length of Growing Season

With the exception of the highest Alleghany Plateau region, the growing season in a normal year is sufficient for the growth of all farm crops commonly produced in the state. In this high elevation, however, the corn crop may be caught by late frosts in the spring or early frosts in the fall. Over most of the state the growing season ranges between 140 and 180 days, with the longest average period between frosts in the southwestern part of the state centering locally in Mingo, Logan, and Wayne counties.

ECONOMIC FACTORS

Markets and Transportation Facilities

Lack of suitable local market outlets for farm products, along with lack of suitable transportation facilities, has played a major role in the development of types of farming in West Virginia. The state has a large industrial population which has never been supplied adequately with food products grown in the state. Most of the larger cities and rural non-farm communities are located in those areas where the physical features of the land are less favorable for agriculture. In many instances the industrial communities are nearer to superior agricultural areas in neighboring states than to the better agricultural areas of West Virginia. These out-of-state areas excel also in transportation facilities for reaching West Virginia markets. The result is that all but a few of the West Virginia farmers are at a disadvantage in competing for the better markets within the state.

The distribution of non-farm population and the density of farm population are shown in Figure 5.

Most of the larger cities and towns are situated either on the navigable streams or where coal mining has developed extensively. The greatest non-farm population is found in the coal areas in the southern part of the state, along the Ohio River, and in the Monongahela River Valley. None of the relatively large cities, except Martinsburg, is located in the areas where agricultural income is of major consideration to a large part of the population.

Until recent years the better agricultural areas have had to depend largely on rail and water transportation facilities, which were none too adequate. Even in areas where the physical features were suitable for the production of cash crops and perishable products, poor transportation facilities operated against the development of this type of farming. The most satisfactory way to market the products of the farm was through livestock, which was driven to the railroads or into the cities for slaughter. Thus both the physical and economic factors have dictated that the agriculture be developed along pastoral lines.

Within the past 15 years highway development has been quite extensive. The roughness of the topography, however, makes the construction of even passable roads expensive. In many local areas the value of the taxable property does not seem sufficient to bear any considerable part of the cost of constructing good local roads; hence many agricultural communities even yet do not have all-weather farm-to-market roads.

The development of the highway system has been accompanied by changes in types of farming, and if and when a good system of farm-to-market roads is developed, still further changes may reasonably be expected. In general, the changes have been from beef cattle and sheep production to dairy cattle, fruits, vegetables, and cash crops. Much of the better land formerly devoted to beef cattle and sheep production seems destined to be used by dairy cattle.

A dearth of local processing and assembling plants has militated against the development of a good marketing structure. In many sections of the state there is not a sufficient number of good-sized farms capable of producing a sufficient volume of surplus products to warrant the establishment of a local processing or handling plant. This is true particularly along the upper tributaries of some of the rivers in the

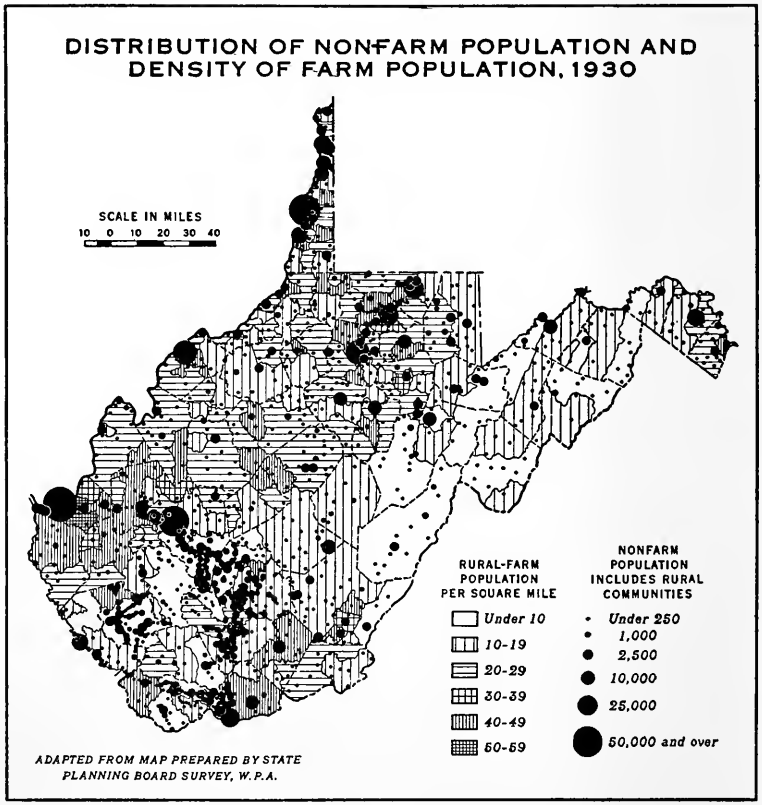

FIG. 5—Rural farm population has its greatest density in districts adjacent to concentrations of non-farm populations. Part-time and subsistence types of farming have resulted in this degree of density. The least density of both rural and non-farm population is in the Alleghany Mountain areas not near to any developed coal areas. The great dependence of the population in the southern coal region upon work in the coal industry is obvious because in this region natural conditions are the least favorable for any type of agricultural income.

northern half of the state, where a considerable amount of crop land is available for some farms, but these surplus producing farms are few in number. The physical set-up on these farms is suitable for dairying, but their locations in relation to a good all-weather highway prevents their marketing dairy products to advantage. There are not enough of these farms to support a local creamery. These farmers, therefore, must either remain in a more extensive type of farming or sell their products in a market of poor structure. A further development of the highway system, particularly of farm-to-market roads, may provide the basis on which a more adequate market structure can be built.

Except for the Eastern Panhandle and the tobacco section, most of the divergence from the pastoral type of agriculture has been occasioned by a local demand for perishable products. National conditions of demand and supply have little effect on the type of farming in these local areas which have developed in response to local demand.

In the southern coal regions where the local demand for perishable products is greatest, the physical facilities for such production are the most limited, hence such local demand is not supplied by local production. All markets in the western part of the state are within easy reach of farmers in Ohio which, in general, possess better physical facilities for producing perishable products and hence largely fill the local demand for such products. This limits the effective demand for West Virginia products even from farms near to these cities and towns.

TYPES OF FARMING

Farms were classified as to type chiefly on the basis of their sources of income. The source of income refers to the product or group of products which the farm produces for sale. An estimated value of the products of the farm used in the family living was added to the value of the products sold or held for sale to make up the total income from the farm.

Where 40% or more of the total income of the farm was derived from a single enterprise, the farm type was designated by the name of that enterprise. For example, if 40% or more of the income of the farm was derived from the poultry enterprise, it was designated as a poultry farm. The classification of the following seven types of farms was arrived at in this manner. In each case 40% or more of the income of the farm was derived from the group of enterprises specified.

1. General farms were those where the value of products from any one source was less than 40% of the total income of the farm. This class of farm indicates a diversity of sources of income no one of which was dominant.
2. Livestock farms—all classes of beef cattle, sheep, lambs, and hogs.
3. Dairy farms—milk, cream, butter, butterfat, dairy cows, and calves.
4. Poultry farms—chickens, eggs, ducks, geese, turkeys.
5. Crop specialty farms—potatoes, tobacco.
6. Fruit farms—tree fruits, small fruits, and vineyards.
7. Cash grain farms—wheat, corn, oats, rye, and buckwheat.
8. Self-sufficing farms were those upon which the value of the farm products used by the operator's family made up more than 50% of the total value of all products produced by the farm.

9. Part-time farms were those whose operators spent 150 days or more off the farm in other than farm work, or reported an occupation other than farming, provided the value of farm products did not exceed $750.

Under the above classification the total number of farms of each type is indicated in Table 1.

Table 1—Number of farms in West Virginia, total value and per-farm value of products sold, traded, or used by operator's family, by types of farms, 1929

Type of farm	Number	Percentage of total	Total income	Income per farm		
				Total	Cash	Used by family—value
			dollars (000)	dollars	dollars	dollars
Self-sufficing	32,622	39.5	18,381	563	177	386
General	16,696	20.2	18,564	1,112	744	368
Abnormal*	14,991	18.1	10,415	695	398	297
Part-time*	(13,712)	(16.6)				
Livestock	6,589	8.0	16,120	2,447	2,074	373
Dairy	2,822	3.4	7,849	2,781	2,398	383
Poultry	1,685	2.0	2,233	1,325	1,032	293
Crop specialty	1,445	1.8	1,579	1,093	797	296
Fruit	962	1.2	4,906	5,100	4,760	340
Cash grain	458	.6	720	1,572	1,299	273
Truck	251	.3	380	1,514	1,203	311
Unclassified	4,120	6.4	——	——	——	——
Total	82,641	100.0		1,033	674	359

*Incomes not available for part-time farms separately. However, 92% of all farms classed as abnormal were part-time farms.

Although the above classification is based mainly upon a minimum of 40% of the total income, actually each group of farms had at least 50% of their incomes from the sources indicated. In cases of definitely specialized farms such as "fruit farms", more than 80% of all products produced for sale was fruit. "Dairy farms" in this classification were also definitely specialized dairy farms.

It should be emphasized that farms classed as "dairy farms" or "poultry farms" were not the only ones producing dairy or poultry products. In general, all types of farms (but not all farms) had these livestock products as sources of income in varying proportions. In like manner, not all fruits produced in the state were produced on "fruit farms", nor all the livestock on "livestock farms". In most cases farms had major and minor enterprises.

Under the above method, the classing of farms as "self-sufficing" and "part-time" gives no indication of the specific sources of receipts, but is mainly an indication of the volume of business done. Analysis of sources of incomes of self-sufficing and part-time farms indicates that these types of farms were similar in operation and in sources of receipts to the prevailing commercialized farms in the same locality, except that their volume of production was smaller. Self-sufficing farms were usually similar to part-time farms in the same locality as regards sources of income, the primary difference being that the operators of the part-time farms worked more days off their farms.

The sources of the incomes of "general" farms varied considerably from one area to another, the various enterprises in one area being quite different from those carried on by "general" farms in another area.

The following graphs show the distribution of the various types of farms throughout the state.

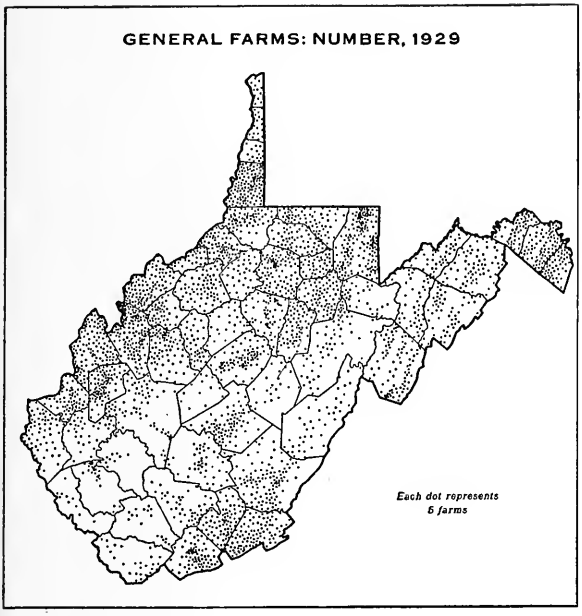

FIG. 6—General farms are found in areas where both crop and livestock production have similar advantages. In 1929, 20.2% of all farms in the state were general farms, and their income was 23% of the gross farm income reported. On general farms, the sale of livestock plus that of livestock products made up about 70% of the cash sales of the farm, with crop sales being only 24% of the total sales, indicating that although this type of farm has a diversity of sources of income, the bulk of it originates in the livestock enterprises.

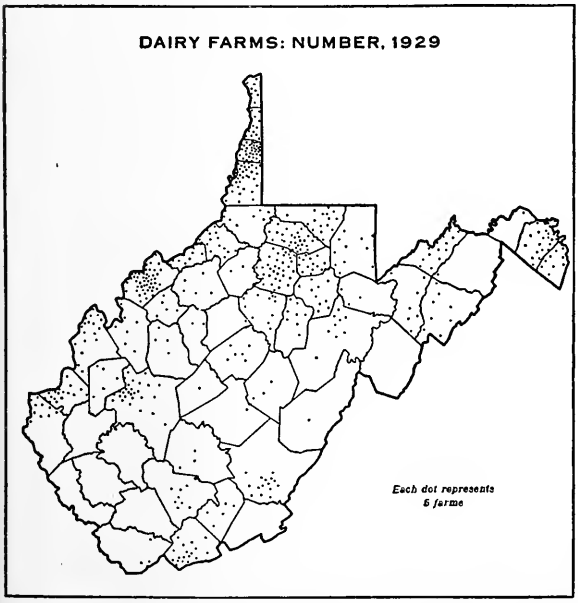

FIG. 7—Dairy farms comprised 3.4% of the total number of farms in the state. The greatest numbers are located in areas either near to the larger cities or in sections from which marketing centers can be reached over good roads. The farms here indicated are mainly the commercial dairy farms selling fluid milk or cream. Only 15% of their total income was from the sale of livestock and crops. In nearly all sections of the state the sale of dairy products, either as farm butter, cream or whole milk, is an important source of income on many farms, but these farms are not indicated on the above map. The limited amount of crop land in most areas necessitates the purchase of relatively large amounts of grain feeds on these commercial dairy farms.

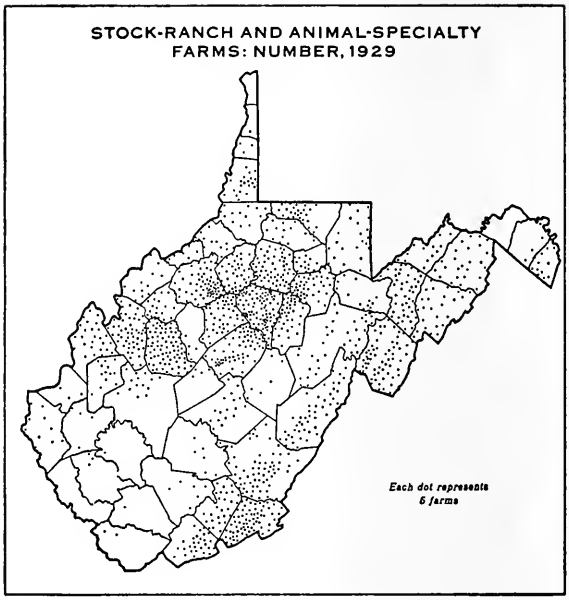

FIG. 8 — Livestock farms comprised 8% of all farms in the state. This type includes those farms upon which the sale of either cattle or sheep and lambs was the major source of income. They are found in greatest numbers in the mountain and foothill valley sections and in the central hilly natural pasture areas. Pasture and hay crops occupy a relatively high percentage of the farm land. These farms have a relatively large acreage and their income is large compared to most other types of farms. This classification does not include a great number of farms in nearly all areas from which the sale of livestock is an important source of income in addition to income from other enterprises.

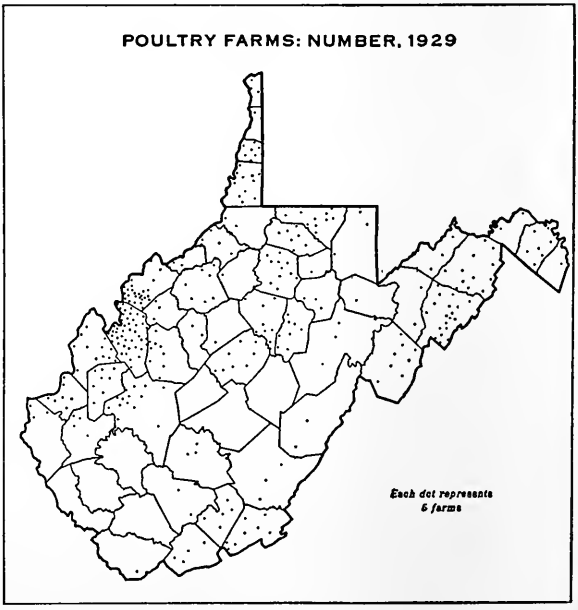

FIG. 9—Poultry farms comprised only 2% of the total number of farms in 1929. As indicated by this map, the greatest numbers of poultry farms were found either in areas around the larger cities or in farming areas where producing was especially favorable. The poultry farms indicated on this map were mainly the commercial poultry outfits, with relatively little income from crops or other livestock. They represent only a small percentage of the farms deriving income from the sale of poultry and eggs. In 1929, 91% of all farms reported chickens, and 80% reported that eggs were sold.

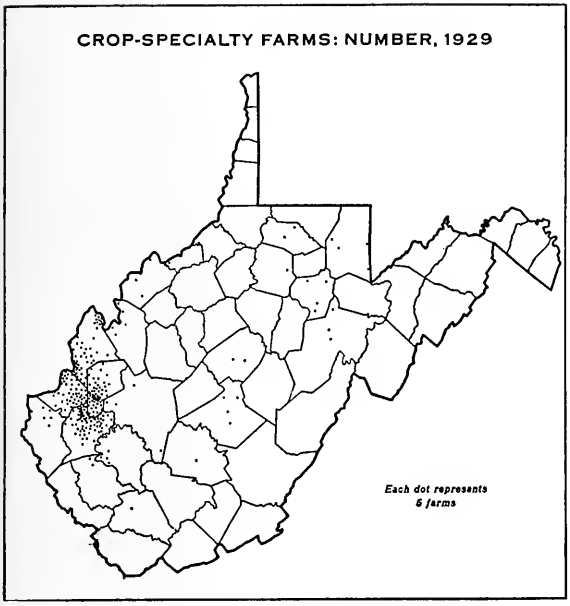

FIG. 10—Crop-specialty farms comprised 1.8% of all farms in the state in 1929. The bulk of the farms were in Putnam, Cabell, Lincoln, and Mason counties where tobacco was the main source of income. This type of farm does not include, however, all of the farms growing tobacco. In 1929, 4,641 farms reported an acreage of tobacco, but only 1,425 farms were classed as special crop farms for the entire state, indicating that a good percentage of the tobacco is grown in small acreages on farms having other enterprises also as sources of income. The scattered farms, in counties other than those designated above, were farms upon which the sale of potatoes made up the main source of income. There are many farms producing potatoes but do not derive a sufficient percentage of their income from this source to be classified as crop specialty farms.

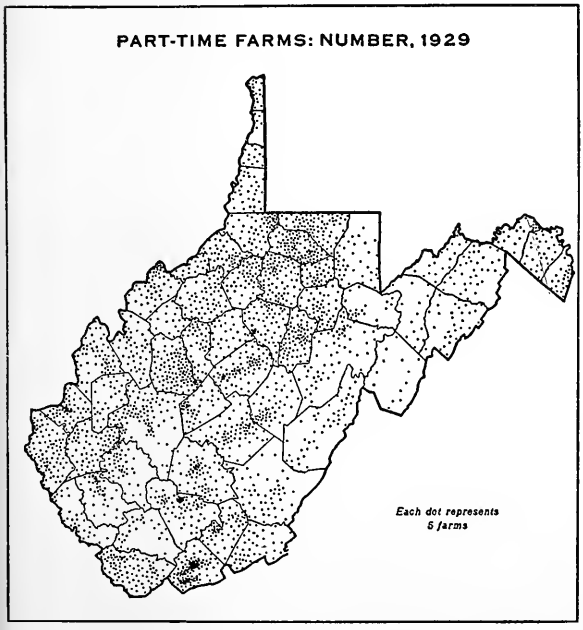

FIG. 11 — Part-time farms comprised 16.6% of all farms in 1929. The greatest numbers of these are found in areas near to population centers and in the coal and gas areas of the state. In most of the areas having a high percentage of part-time farms physical facilities for agricultural production are relatively poor and many farmers have been forced to seek outside sources of income. Changes in industrial activity affect these farmers materially.

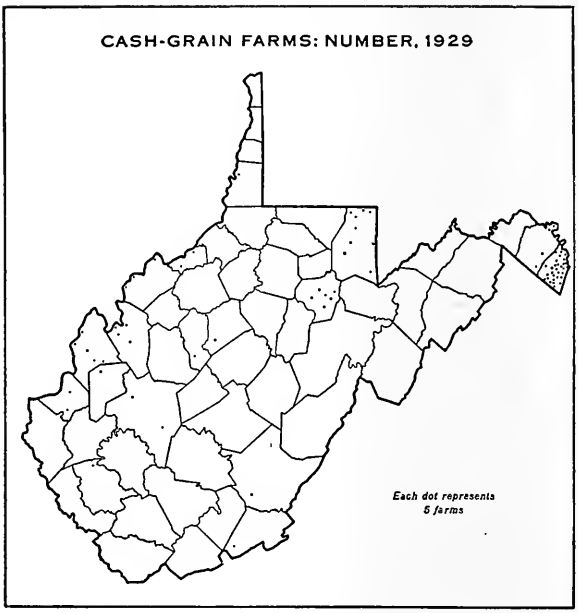

FIG. 12—Cash grain farms comprised 0.6% of all farms in 1929. The greatest numbers of them are found in Jefferson County where wheat is a major farm crop. In this county 18% of all farms were of this type, but they were of minor importance in all other areas. Although corn is the most important grain crop grown in the state it is seldom sold from the farm where grown.

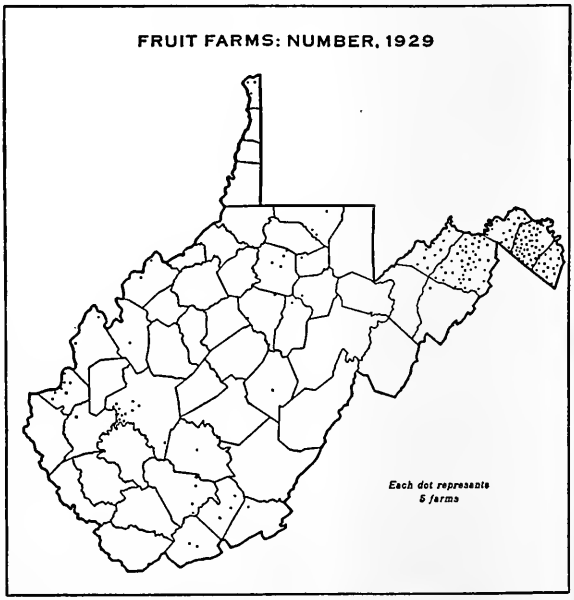

FIG. 13—The farms shown on the adjoining map were strictly commercial fruit farms, with 86% of their total income for the year 1929 coming from the sale of fruit. Fruit farms comprised 1.2% of all farms. As a rule the commercial fruit farms had a much greater investment as well as gross income per farm than other types of farms. Practically all of these farms had apples as the principal fruit crop, but in Hampshire and Berkeley counties peach orchards were of considerable importance. The fruit farms in the Eastern Panhandle are in the area which is a part of one of the most concentrated apple producing regions of the United States.

The above classification does not include the many farms found in nearly any section of the state from which the sale of fruit was of considerable importance.

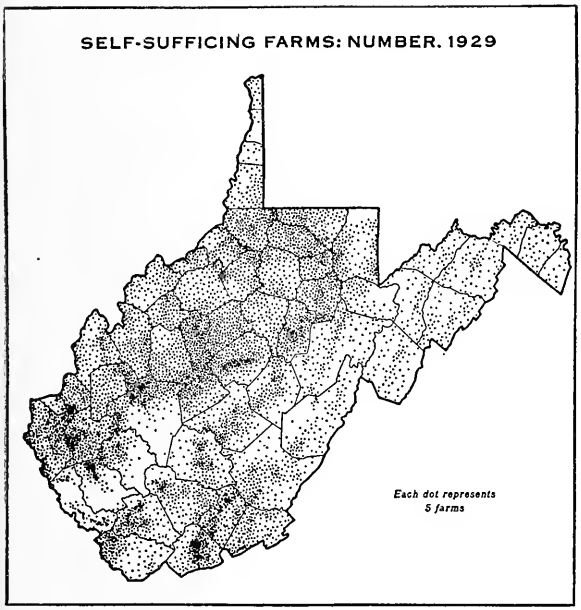

FIG. 14—Self-sufficing farms made up 39.5% of all farms in the state in 1929, with the greatest percentages being found in Wyoming, Clay, and Calhoun counties. Generally speaking the greatest numbers of these farms were found in areas having the least advantages in carrying on a commercial type of agriculture. The average gross income to this type of farm was only $563 per farm of which 68% was represented by the value of the products grown on the farm and used in the home by the operator's family, leaving an average cash income from the sale of products of $177 per farm. On many of these farms the operator received some income from work off the farm.

The organization of the enterprises on this type of farm follows the general pattern of the dominant type of farm in the locality. The chief difference between the self-sufficing farm and other farms in the local area is in the matter of acreage, size of enterprises and volume of sales.

TYPE-OF-FARMING AREAS

Because of the combined influence of the physical, biological, and economic factors, certain types of farms have come to dominate the agriculture of an area. These areas are referred to as "type-of-farming areas". The state was divided into 12 such areas based primarily on the dominant type of farm in respect to source of income. Exact lines of demarcation between areas cannot be drawn because they are shifting in nature. In naming the type-of-farming areas in the state the practice was followed of using several designations, with the most important type of farm appearing first in the title, and proceeding in the order of importance from the standpoint of the income which the type of farm contributed to the area.

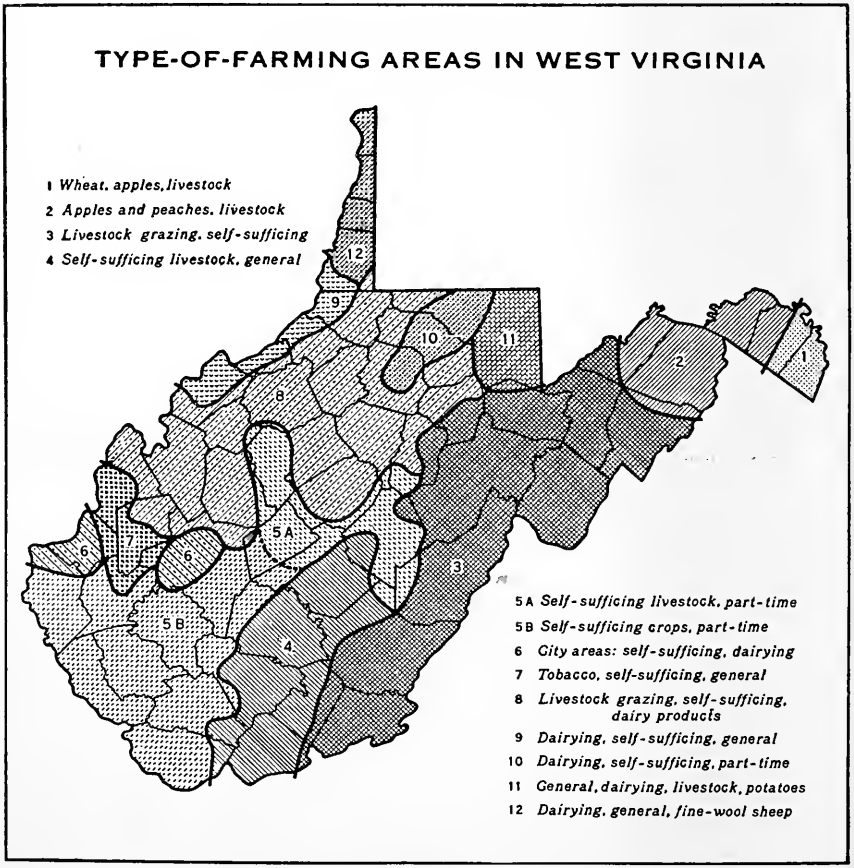

Figure 15

DESCRIPTION OF TYPE-OF-FARMING AREAS

AREA 1—WHEAT, APPLES, LIVESTOCK

Area 1 includes all of Jefferson County and the districts of Falling Waters, Opequon, Arden, and Mill Creek, comprising the eastern half of Berkeley County. A high percentage of the area has Hagerstown soil with rolling to level topography, which are the two major factors that have determined the type of farming followed. Along Opequon Creek and bisecting the area is a strip of hilly land with a soil type suitable for apple production but not so well suited for general crop production as Hagerstown soils.

For the area as a whole, 89% of the land has an average slope of less than 12%, the highest percentage of relatively level land of any area in the state. About two-thirds of the land is classed as best crop land (Class 1), with some above average crop land (Class 2) along Opequon Creek in the valley and a strip of forest land (Class 7) along the eastern border of the area. Most of the land is underlain with limestone, and in certain sections limestone outcroppings make the land unsuitable for tilled crops, but it fosters a luxuriant growth of blue grass, which is used for pasture.

Land Use. In 1929, 90% of the total land area was in farms; 52% of the land in farms was in crops; 32% in open pastures; 3% in woodland pastures; 8% in woods not pastured; and 5% in farmstead and waste.

This area had the highest percentage of farm land in crops of any area in the state, and also had the highest percentage of the land area in farms. The proportion of pasture to total farm land was relatively low because livestock feeds were derived to a greater extent from grain crops than in other areas, and the good limestone soil gave a natural pasture which carried more livestock per acre than in most other areas.

Crops. Wheat occupied 40% of all crop land in 1929; corn, 28%; hay, 17%; and orchards, 11%. Because of the limestone soils which are favorable to good yields of wheat, its production has been a major enterprise on farms for many years. The topography is level enough to permit machine production methods, and the crop land per farm is of sufficient extent to permit the production of corn and hay for livestock feeding. The crops grown in rotation are corn, wheat, and hay, the importance of each in the rotation being determined by the type of farming followed on the individual farms. On wheat farms, where livestock production is only of minor importance, wheat may occupy 60% of all crop land, being grown for three years in a 5-year rotation. On farms where livestock production is the major enterprise, wheat often occupies only about 20% of the crop land, with corn and hay claiming the greatest acreage. Since 1900, the hay acreage in the area has increased about one-third at the expense of both corn and wheat. This has resulted from the shift in attention from hogs to dairying. Timothy and clover mixed hay are dominant, but in recent years alfalfa acreage has increased steadily. Oats and barley are of minor importance as farm crops.

Although commercial apple orchards are found in nearly all sections, they are concentrated to the greatest extent on the shale soils and on the more rolling land. In these rolling land areas soil conditions and air drainage are favorable to orcharding. In the area as a whole the numbers of apple trees increased steadily from 1910 to 1929, but have decreased since that time. In recent years the increase in plantings has been mainly in larger commercial orchards, while the farm orchard and the small commercial orchard on diversified farms has decreased in importance as a source of fruit for sale.

Livestock. Dairy cattle, hogs, beef cattle, and sheep are each important sources of income. Conditions favorable to the production of feed grains and hay naturally make the sale of livestock and livestock products a major source of income on many of the diversified farms. Before 1900 beef cattle production, fostered by the good pastures prevailing on the limestone soils, was a major farm enterprise. Since 1900, with the increase in available market outlets for dairy products, beef cattle have been replaced gradually to a considerable extent by cattle kept primarily for dairy purposes. Whole milk, cream, and butterfat are the principal dairy products sold, and in large part the beef produced comes from the cows kept for dairying. The relatively large acreage of corn per farm formerly contributed to hog production as a major enterprise on many farms. The dairy cow, however, has won in the competition for feed to such an extent that the numbers of hogs in the area declined nearly 50% between the years 1920 and 1930. In spite of this, however, this area continues to be the most important commercial hog-producing area of the state. Farm flocks of sheep are kept on many farms, but the sale of lambs, wool, and aged ewes is relatively not of major importance as a source of income. Chickens are kept mainly in farm flocks to supply products for the farm family, but the large quantities of corn and wheat produced are favorable to poultry feeding, and many farmers market considerable quantities of eggs and chickens from relatively large farm flocks. Very few specialized poultry farms are found in the area. Turkeys have become an important source of income to a few farms.

Sources of Income and Types of Farms. The sale of crops made up about 58% of the cash sales of all farm products in 1929; the sale of livestock, 21%; and livestock products, 20%. About 65% of the value of livestock products sold was composed of dairy products; 31%, eggs and chickens; and 4%, wool. Crop sales were principally of wheat and apples. The varied kinds of farm enterprises of importance indicate the diversity of farming types in the area.

TYPES OF FARMS

General Farms. Farms of this type constituted 32% of all farms in the area. The income from the sale of crops was 38%; livestock, 30%; and livestock products, 32% of their total cash income. Wheat and apples were the principal crops sold. Under general farms were included many farms having small commercial apple and peach orchards but growing wheat for an additional cash crop and producing corn and

hay for livestock feeding. Dairy cows were kept on 96% of the general farms. Whole milk and cream were the principal livestock products sold, with surplus eggs and chickens from the farm flock being a smaller part. Hog production was an important enterprise on these general farms, with two-thirds of them keeping sows and gilts. The livestock sold consisted mainly of hogs, calves, and young stock from the dairy herd and a few lambs and ewes. Tenants operated 45% of the general farms.

Cash Grain Farms. This type made up 18% of all farms in the area. The income from the sale of crops was 63% of the total cash income; livestock, 18%; and livestock products, 19%. Cows kept for dairy purposes were found on 90% of the farms of this type. Tenants operated 66% of the cash grain farms, with a share-rent system of leasing prevailing. Cash income from wheat made up the bulk of the crop receipts, hogs and cattle the bulk of the livestock receipts, and dairy products and eggs most of the receipts from livestock products. The average size of the cash grain farms was 210 acres, 32% greater than the average for grain farms of the state.

Fruit Farms. Although fruit farms comprised only 10% of the total number of farms, and orchards occupied only 11% of the total crop land, the gross income from fruit was 33% of the total farm income of Area I in 1929. This reflects an unusual situation. Apple yields per acre in 1929 were above average, and the prices received for apples that year were also relatively high. The 81 farms classified as receiving more than 40% of their income from fruit were mainly the large commercial orchards producing apples. In 1929, these fruit farms received 90% of their total cash income from crops. Tenants operated only 16% of the fruit farms. Dairy cows, hogs, and poultry were the principal livestock found on these farms, but these enterprises were of minor significance in the operation of the farm business.

Other Types of Farms. Livestock farms, which made up 7% of the total, had an average size of 237 acres. The cash income was 62% from livestock, 23% from crops, and 15% from livestock products. The livestock sold was composed of hogs, cattle, and lambs. Many of these farms finished out steers, imported as feeders from other areas, on pasture and grain. Dairy farms, generally speaking, were of the type where milk production was the major enterprise but where wheat and livestock were minor enterprises of importance. Poultry farms had only 69 acres per farm, and their cash income was 84% from poultry products, indicating a relatively high degree of specialization. Although 63% of the total gross income of self-sufficient farms was the value of products used by the operator's family, about one-half the total cash income was derived from livestock products sales, indicating that this type of farm was mainly in the poultry and dairy business.

The record of a fairly typical farm may serve further to portray the dominant type of farming in the area.

ORGANIZATION OF ONE WHEAT-LIVESTOCK FARM IN JEFFERSON COUNTY (AREA 1), 1934 (FARM "A")

Acres in Farm	147	*Investment in Farm*	$12,554
Crops	105	Land	7,000
Open pasture	30	Buildings	3,800
Woods not pastured	4	Machinery and equipment	587
Farmstead, roads, waste	8	Livestock	1,167

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	20	1000 bu.	1000 bu.	.....
Wheat	38	988 bu.	85 bu.	903 bu.
Mixed hay	43	43 T.	28 T.	15 T.
Orchard	4	155 bbl.	5 bbl.	150 bbl

Livestock Numbers				
Cows	4	1200 gal. milk 4 calves	100 lb. butter	300 lb. butter 2 calves
Heifers	1	.....	.....	.....
Steers	4	.....	.....	2
Horses	6	4 colts	.....	3
Colts	3	.....	.....	.....
Sows	2	14 pigs	2 hogs	12 hogs
Chickens	150	570 doz. eggs	200 doz.	370 doz.
		150 chickens	50	100

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 111	Wheat 903 bu. @ 96c	$ 867
Feeds, 2 T.	56	Hay 15 T. @ $14	210
Fertilizer, 6 T.	144	Apples 150 bbl. @ $2.30	345
Labor (12 mos.)	360	Colts 3 @ $50	150
Labor (day)	60	Calves 2 @ $12	24
Other cash	497	Butter 300 lb. @ 20c	60
		Beef 1800 lb. @ 6c	108
	$1,228	Pork 2400 lb. @ 6c	144
		Eggs 370 doz @ 20c	74
		Chickens 100 @ 55c	55
			$2,037

Cash receipts less cash expenses = $809.

Farm products used by family of 4: 25 bu. wheat for flour, 20 bu. potatoes, 100 lb. butter, 200 gal. milk, 350 lb. dressed pork, 200 doz. eggs, 50 chickens, vegetables from gaden, apples and peaches.

Farm "A" illustrates a type found in Area 1, where wheat production is a major enterprise. Nearly all the land of this farm was tillable, and about 70% of it was in crops. Rotated pasture had a high carrying capacity, and the yields of grain crops were relatively high. Corn, wheat, and mixed hay were the only field crops grown, but a four-acre apple orchard with trees about 10 years old was situated on a slope. The orchard was beginning to yield enough apples to make up an important source of receipts, but they were still sold in bulk, none being packed on the farm.

Shorthorn cattle were kept primarily for beef production, but they supplied milk for some butterfat sales. The limited pasture acreage on the farm restricted the number of beef steers. The farm usually sold two steers each year to which considerable grain had been fed. Pork production was also a minor source of income. Brood mares were kept,

and ordinarily three yearling colts were sold each year. Fertilizer was applied to the wheat and manure to the corn ground.

In the year indicated, about 70% of all farm receipts on this farm were from wheat, hay, and apples, all of which sold for relatively good prices. Livestock prices, however, were relatively low in that year. In periods of unfavorable wheat prices, wheat acreage is decreased, corn acreage and perhaps barley acreage is substituted, and thus more livestock can be kept on the farm. A farm of this type is thus able to shift emphasis from grain to livestock, and vice versa, as the economic conditions warrant.

Usually the smaller orchard, such as is found on this farm, has not proved to be very remunerative. The acreage is too small to warrant expenditures for good spraying and tillage equipment necessary to insure adequate yields of good fruit.

About one-half of the cash expenses of production was for labor, including the salary of the manager. The next largest item of expense was for barrels and baskets. The average price per barrel for all apples sold was $2.30. The percentage of apples which are sold packed, in bulk, or for processing purposes depends greatly upon the prices prevailing at harvest time. With a good price a larger percentage of the total crop is packed into containers than in years of relatively low prices. Bulk apples usually sell for considerably lower prices than packed apples in any one year, because of the cost of containers and labor used in packing. Many orchards, not having sufficient acreage of fruit to operate their own packing house and having no cooperative packing house near, sell their apples as "orchard run", the buyer doing the grading and packing.

AREA 2—APPLES, PEACHES, LIVESTOCK

This area comprises the northern end of the Appalachian foothill region adjacent to the valleys of the Potomac River and its tributaries where the elevation on the average is low enough so that frost hazards and cold weather do not limit too greatly the growth and production of fruit trees. The area extends westward to include that portion of Mineral County east of the sharp rise in elevation of the Alleghany Front.

For the area as a whole, 34% of the land has a slope of less than 12%, and 9% a slope of over 40%. The greatest amount of level land is found in Berkeley County along the edge of the Shenandoah Valley; in the South Branch and Cacapon River Valleys in Hampshire County; and in the Patterson Creek and New Creek Valleys in Mineral County. These valleys are very narrow in some sections, but tend to widen as they approach the Potomac River at the lower elevations. The largest areas of land having a slope of over 40% are found in Cacapon District in Morgan County. The best crop land is found in Hampshire County in the South Branch Valley. The tops and sides of the ridges for the most part are forested. The cleared side slopes for the most part are poor crop land or average pasture land, with the valley lands being average or below-average crop land. On the tops and sides of ridges,

the soils and the air and water drainage in many sections are well suited to tree fruits, but this land is too steep or too rocky for field-crop production. In Berkeley County the fruit trees are found for the most part on below-average crop land.

Land Use. The total land in farms in 1929 made up 70% of the land area. Crop land comprised 25% of all land in farms, open pasture 39%, woods not pastured 30%, and other land 6%. Because of the rather wide variations in topography, the relationship between crop land, pasture, and woodland varied considerably within the area. Generally speaking, the proportion of the land in crops was directly proportionate to the amount of land with a slope and soil type suitable for crop production. In the sections of rougher topography as in Mineral County, pasture acreage as well as woodland, therefore, made up a larger proportion of the total acreage.

Crops. Corn, wheat, and hay crops occupy most of the rotated crop land. Corn occupied 21% of the crop land in 1929 with little variation in percentage from one section to another. As the area becomes rougher in topography from Berkeley County west, and limestone has less influence upon the soils, the part of the crop land in wheat becomes smaller and the part in hay becomes larger. Oats is substituted for wheat to some extent in the rotation in the western section of the area. In many local sections the land suitable for crops is limited, and the cropping system on each farm is determined by the soil types and slope prevailing. In local valley areas where the acreage of relatively level land is not so limited, a consistent rotation of corn, small grain, and hay is practiced. On other farms with only a small acreage of land which can be broken for field crops, more dependence is placed upon pasture and hay as a source of feed, and on such farms the hay acreage may comprise 40 to 50% of the land in crops.

For the entire area, orchards occupied one-fourth of the land in crops in 1929. With the exception of certain areas in Berkeley County, orchards occupy land on the more rolling to steep slopes, on high rolling ridges, or on land having a shale or stony soil not well adapted for field crops, but which has a relative advantage for orchards. The expansion in numbers of apple trees in Berkeley County and in the eastern half of the area was rapid between 1890 and 1930, the numbers increasing about 400% between 1910 and 1930. In the western half of the area, conditions are not as favorable for orchards as in the easteren half. Between 1910 and 1920 many trees were planted in local sections where soil types or air drainage or both were unfavorable, and there has been some abandonment of orchards. Many orchardists use peach trees as fillers in apple orchards because of their earlier maturity and shorter life. Peach trees proved less hardy than apples, and the normal weather hazards plus unfavorable soil conditions caused a large abandonment of peach orchards where they had been planted extensively between 1890 and 1920. This is true particularly in Hampshire and Mineral Counties. Between 1920 and 1930 about three-fourths of the total number of peach trees in Hampshire County were either abandoned

or pulled out, the abandonment being in the least favored areas. In the local sections where soil types and drainage are favorable, however, peach production continues to be an important enterprise, and in 1930, Hampshire and Berkeley Counties were the most important peach-producing counties in the state.

Livestock. While livestock enterprises contributed about 28% of all cash income to farms in the area in 1929, they were of minor importance except in certain local areas. Cattle, sheep, and hogs, named in order of their importance, are found in all sections. The local feed supply and availability of markets determine the importance of each for the locality. Berkeley County, with a relatively large production of corn, is most important in hog production, while in other sections the enterprise is carried on mainly to produce meat for farm family consumption. Cattle are mainly of the dairy type, particularly in Berkeley and Mineral Counties, where local markets are available for whole milk, butter, or cream. In Hampshire County, with relatively large areas of rough pasture, sheep are of more importance than in the other counties. Cattle which produce milk for farm and local consumption and also produce steers to utilize the pastures predominate in this county, there being little commercial dairying.

The numbers of cattle in the area have remained relatively constant, with a tendency to decrease in Morgan County and to increase in other sections, especially the number of cows kept for milk purposes. The number of sheep have decreased in all sections since 1900, the greatest decreases being in Berkeley and Morgan Counties. Hog numbers in 1930 were about one-half those in 1900, the decline being rather uniform in all sections. The numbers of chickens on farms increased steadily from 1880 to 1930 in all sections of the area, but the poultry enterprise was most important in Hampshire and Morgan Counties, where the dairy enterprise was least important. Because of the lack of surplus grain feeds in most sections of the area, the poultry enterprise is only of comparatively minor importance.

Sources of Income and Types of Farms. In 1929, crop sales provided 53% of the total gross income of the area; livestock and livestock product sales, 28%; and products used by the operator's family, 19%. Crop sales were mostly from apples and peaches, with wheat being of importance only in Berkeley and Morgan Counties. Dairy product sales made up one-half of the livestock products sold; eggs and poultry, 46%; and wool, 4%. In Mineral County, orchards were less important, occupied a smaller part of the crop land, and the proportion of the income from apples, peaches, and other crops was lower than for other sections of the area, with the livestock enterprises being of more importance.

TYPE OF FARMS

Fruit Farms. Farms of this type made up only 13% of all farms and occupied 16% of the crop land but received 49% of all the cash income of the area. The concentration of apple and peach orchards in the area varies, the highest percentage being found in Berkeley County

and decreasing in Hampshire, Morgan, and Mineral Counties in the order named. As in Area 1, fruit farms here indicated were the specialized commercial organizations with at least 90% of all income from apples and peaches. The topography of the various sections of the area has been of importance in developing fruit farms. In Berkeley County, rather large areas are found to which orchards are adapted naturally, and as a result the average size of planting was nearly double the average size of orchard in Hampshire County, where the hilly topography, with intervening low lands, has limited the extent of favorable contiguous acreage. In Morgan and Mineral Counties the relatively large orchards are restricted to local favorable sections. The relatively small orchard operated as an enterprise in conjunction with livestock farming was more common in Hampshire County than in other sections.

The specialized fruit farms produce apples and peaches only, with peaches being of least importance in Berkeley County, where apple production is highly specialized. The average investment per acre in an orchard is high. The crop acreage per fruit farm in Berkeley County was 88, which was practically all in orchards. In Hampshire County the fruit farms were smaller in acreage, having 62 acres in all crops per farm. Their operation was carried on more by the family labor than in Berkeley County, where the large units were operated to a greater extent by hired labor and managers. On the smaller orchards as found in Hampshire County, other crops and livestock products were also produced to some extent, mainly for farm family consumption, but a high percentage of the cash income was from the sale of fruits.

General Farms. Farms of this type made up 31% of all farms in the area, and received 21% of the total cash income. Many of them were those upon which a small fruit orchard was combined with livestock enterprises to give a diversified income. The livestock enterprises were primarily dairying or poultry, with dairying of greatest importance in Berkeley and Mineral Counties and poultry of greatest importance in Hampshire and Morgan. Livestock sales were relatively small on all these farms, but were of more importance in Hampshire and Mineral, where sheep and beef cattle are pastured on the rougher lands not suited to crop production.

Self-Sufficient and Part-Time Farms. Although 35% of all farms in the area were of these types their total income was only 11% of the total farm income of the area. These farms were found in greatest numbers in sections near the larger towns and in districts where the opportunities were most limited for commercial agriculture. The gross farm income on these types of farms was relatively low. The value of farm products used by the operator's family made up over 60% of their gross income, thus leaving a quite small cash income from the sale of farm products. The sale of dairy and poultry products made up about one-half of the cash income of these farms, with crop sales, such as small fruits and vegetables, of more importance than the sale of livestock.

Other Specialized Farms. Specialized dairy farms were 9% of all farms in Berkeley and Mineral Counties. These farms were producing milk mainly for consumption in the local cities, and usually a large part of their income was from the dairy business. In these two counties local creameries afford a market for cream. On many farms not classed as dairy farms, dairy products were an important source of income.

Very few specialized livestock farms were found in the eastern half of the area, but in the western half the available pasture made the beef cattle and sheep enterprises of major importance on a few farms.

The following record of a commercial fruit farm in Berkeley County may further portray the dominate type of farm in this area.

ORGANIZATION OF ONE COMMERCIAL ORCHARD IN BERKELEY COUNTY (AREA 2), 1934 (FARM "B")

Acres in farm	51	*Investment*	$21,152
Acres in apples	51	Real estate	18,463
Cash Expenses		Machinery and equipment	2,653
Taxes and insurance	$ 102	Livestock	36
Fertilizer 7½ T.	278	*Cash Receipts*	
Labor (12 mos.)	940	Apples 4,578 bbl. @ $2.16	$9,888
Picking labor	636		
Packing labor	1,336		
Hauling labor	513		
Spray material	278		
Barrels, baskets	1,449		
Machine repairs	307		
Other cash	771		
Total	$6,610	Cash receipts less cash expenses	$3,278

The above farm was a commercial apple orchard with the entire acreage in apple trees. There was no livestock on it. The farm was operated by a manager who lived in a small cottage, the only dwelling on the farm. The only other building was a shed for housing machinery. The land on the farm was gently rolling. On the 51 acres there were 3,406 apple trees of bearing age, an average of 67 to the acre.

The investment, except for machinery, was mainly in the orchard, which in 1934 was valued at $300 per acre. As on all farms of this type, the investment in machinery was relatively large. A tractor and motor truck furnished the power used on the farm, except that electricity was used for pumping water. A stationary spray system, picking bags, ladders, crates, pruning shears, and saws, a tractor plow and disc harrow were also items of investment. Seven hives of bees were kept in the orchard for their aid in pollination.

This orchard has had excellent care and management and the yield obtained in 1934 averaged 90 barrels of salable apples per acre. The average yield of apples in the area has been about 60 barrels per acre.

In the year indicated, 63% of the apples were packed in barrels and about 3% in bushel baskets; the remainder was sold in bulk. The packing was done at a local cooperative packing plant.

AREA 3—LIVESTOCK GRAZING, SELF-SUFFICING

Area 3 includes, in general, the Alleghany Mountain and Plateau region of relatively high elevation, and the high foothill region east of the Plateau in Grant, Hardy, and Pendleton Counties. It extends southward through Monroe County. It is the highland pasture area of the state.

In the narrow South Branch Valley in Hardy County the elevation is less than 1000 feet; the lower lands in the eastern half of Grant County and in Hardy County have an elevation of 1000 to 1500 feet; the valley lands in Pendleton County 1500 to 2000 feet. The elevation rises abruptly along the Alleghany Front in Grant and Pendleton Counties to more than 3000 feet and on the plateau except in the stream valleys the elevation is still greater. Along the upper end of the Greenbrier River Valley in Pocahontas County the elevation is between 2000 and 2500 feet, but decreases gradually until in Monroe County it is between 1500 and 2000. Sharp ridges lie on both sides of the Greenbrier Valley, rising to more than 3500 feet. In general, the ridges and mountains extend through the entire area from northeast to southwest. The valley of the Tygart's River in Randolph County has an elevation of between 1500 to 2500 feet with the river flowing towards the north.

For the area as a whole, 21% of the land has a slope of less than 12%, and 21% has a slope of more than 40%. The largest areas of relatively level land are found in th South Branch Valley, on the Appalachian Plateau table lands, in the valleys of Tygarts River and Leading Creek and in the lower Greenbrier Valley. Small patches of level land are found along local creeks and rivers. The Cheat River, one of the principal rivers in the area, flowing through Randolph County, has no valley of any extent in the area, the topography usually getting rougher towards the river. While the upper Greenbrier Valley in Pocahontas County is usually quite wide, very little level land is found in the county, the valley being characterized by long steep slopes rising from the river, with occasional hills and ridges intersecting the valley.

The only area of superior crop land (Class 1) of any extent is in the South Branch Valley in Hardy County, with some above average (Class 2) strips of crop land bordering it. A high percentage of Area 3 is primarily forest land, with average or above-average crop land being found chiefly in the river and stream valleys. The largest unforested areas are either average pasture land, poor crop land, or submarginal land for farming (Classes 5 and 6). The relatively level lands in Tygarts Valley in Randolph County and in the Greenbrier River Valley in Greenbrier and Monroe Counties are above average (Class 2) crop land. These lands are bordered by average pasture land or poor crop land (Class 5).

In many sections limestone, which originally underlay a large part of the area, has had a decided influence in determining the quality of the soil. Erosive action has cut the valleys down through the limestone rock so that at present only a small amount of limestone is found in the valley bottoms. The influence of this eroded limestone still prevails

in the soils of the Greenbrier Valley, however, and they have a limestone deficiency less than in many other sections of the state. Limestone at present is found mainly on the tops and sides of ridges and mountains at the higher elevations.

Land Use. The counties composing this area have a land surface of approximately 3,541,760 acres, 51.4% of which was in farms in 1930. The wide variations in topography, soils, and forest cover in the area have led to variations in the amount of land suitable for farming in various sections. Hardy County and most of Grant and Pendleton Counties lie to a great extent in the lower foothill section, with no high ranges intersecting. The land in farms was about two-thirds of their land area. Monroe County had 76% of its land in farms. On the other hand relatively high ranges bisect Tucker, Pocahontas, Randolph, and Greenbrier Counties, and the land in farms made up only from 40 to 45% of their land areas. Over the entire area the land which can be planted to crops is limited. Monroe County, with 19% of the land in farms planted in crops, had the highest percentage, with Pendleton and Grant Counties the least, 13% each.

In the area as a whole 15.6% of the land in farms was in crops in 1929; 54% in pasture, of which 35% was open and 19% woodland pasture; and 47% in woodland. Monroe County had only 31% but Pendleton County had 61% of the land in farms in woods. In the high mountain sections the woodland was used to a greater extent for pasture.

Crops. With only 21% of the total land area with a slope of less than 12%, the amount of ground which can be broken for crops is definitely limited. Of the 15.6% of farm land in crops in 1929, hay occupied 47%; corn, 23%; wheat, 11%; and oats, 8%; the remainder being miscellaneous acreages of farm orchards, potatoes, buckwheat, etc. Variations in the percentage of land in corn within the area is related directly to the amount of relatively level land prevailing. The general rotation followed on farms is corn, small grain, and hay. On farms with only a small amount of land suitable for crops, hay acreage usually constitutes a high percentage of the total crop land, but on farms with more crop land a greater acreage is planted to corn and wheat or oats. In the areas of highest altitude, as in Tucker, Randolph and Pocahontas Counties, wheat acreage has been replaced to a great extent by oats with a relatively larger acreage in hay crops. Corn acreage in the high altitudes is restricted also by the short growing season; and in sections where dairy cows are kept as a part of the farm business, much of the corn acreage is cut for silage. In the areas of lower altitudes wheat acreage was highest during the war period, but has dropped off as much as 50% since that time, the greatest declines coming in the southern section of the area in Greenbrier and Monroe Counties. Wheat acreage is relatively small per farm and the fluctuations in total acreage in the area are often rather wide from year to year. Oats was of only minor importance in all sections, and the acreage remains rather constant from year to year.

Although orchards occupied about 6% of the crop land in 1929, the vast majority of trees received no care, and the production was of low quality for use in the home and for livestock feed. A few scattered commercial orchards are found in the lower Greenbrier River Valley. Buckwheat was of some importance in Tucker County, where the relatively poor soils and short, cool growing season make this crop one of the most successful that can be grown.

Livestock. With pasture the principal source of feed, cattle and sheep are the most important sources of income. Cattle are found on nearly every farm, and the numbers of sheep per farm are relatively large. The greatest concentration of sheep is found in Pendleton and Pocahontas Counties with the least in Tucker County. While beef cattle remain the principal type, cows kept for dairy purposes have tended to increase in many sections, especially in the lower Grenbrier Valley and in the South Branch Valley in Hardy County. The poultry enterprise was of next importance to sheep and cattle as a source of income. While some specialized poultry farms were found, farm flocks predominated. In the sections of lowest elevation, where wheat and corn are grown more generally, the income from poultry makes up from 15 to 20% of the cash farm income. More chickens per farm were kept in Hardy County than in any other section of the state. Hog production in the area is mainly for farm consumption. Around the year 1900, hogs were commercially important especially in those sections having a considerable acreage of corn. Since that time, however, poultry and dairy cows have tended to replace hogs as the users of corn, and the numbers have declined as much as 60%. Pork and pork products make up the bulk of the meat used by the farm family. In many areas some farmers produce surplus pigs for sale to neighbors, and many farmers sell small quantities of farm-butchered pork and pork products in the local markets.

Sources of Income and Types of Farms. Livestock sales provided 57% of all cash income to the area in 1929; livestock products, 27%; crops, 8%; and forest products, 8%. The dependence of the farms on the livestock enterprises is obvious, with 84% of their cash income from these sources. Receipts from dairy products amounted to 32% of the value of livestock products sold; eggs and chickens, 56%; and wool, 12%. Crop sales were mainly from wheat and potatoes, some from buckwheat in Tucker County and some from apples either from farm orchards or the few commercial orchards. Income from poultry was more important in Hardy, Pendleton, and Monroe Counties than in other sections of the area, and dairy product sales were relatively greater in Greenbrier, Randolph, and Tucker Counties.

Sales of beef cattle, calves, and lambs made up the most of the sales of livestock. Wool constituted a greater percentage of the sales of livestock products in Pocahontas and Pendleton Counties, the sections of greatest concentration of sheep.

Specialized Livestock Farms. This type of farm made up only 16% of the total number of farms but received 39% of the cash income of the area and had 38% of all the land in farms. The income from the

sale of beef cattle and sheep was slightly over three-fourths of all their cash income, with the sale of livestock products making up 15%. Crop sales were only 6% and forest products the remainder. Of the 1758 livestock farms in the area, 26% of them had an area of pasture land at least five times the crop land acreage on the farm. These large farms varied in size from an average of 542 acres in Grant County to 931 acres in Pendleton. The 74% of the livestock farms with pasture acres less than five times the crop acres had an average size of about 275 acres per farm.

Self-Sufficient Farms. The relatively small amount of business done by the average farm in the area makes the value of the farm products used by the operator's family a relatively large part of the gross income on many farms. In 1929 on 36% of all farms in this area, this item made up more than one-half of all the gross farm income and hence they were classed as self-sufficient. There were more of this type of farm than of any other type. Self-sufficient farms occupied 21% of the farm land but received only 18% of the cash income. The cash income from the sale of farm products ranged from $171 per farm in Grant County to $241 per farm in Pocahontas. This cash income, on the average, was derived as follows: from crops, 12%; livestock, 37%; livestock products, 46%; and forest products, 5%. In comparison with all farms of the area, the self-sufficient farms placed a relatively greater dependence on the sales of poulty, eggs, milk, and butter. Their pasture acreage was not sufficient to maintain much livestock. The value of family living made up about 62% of the gross farm income. On a large majority of these farms the operator derived some additional income from work off the farm.

General Farms. There were 2647 general farms in the area in 1929, or 24% of the total. Their average size ranged from 126 acres in Greenbrier County to 214 acres in Grant County. Income from the sale of livestock was 37%; livestock products, 38%; crops, 16%; and forest products, 9% of all cash income. The value of family living was about 34% of the gross income. As on all the smaller-sized farms in the area, the poultry and dairy enterprises were of relatively greater importance on general farms than on the farms having the larger acreage of pasture for beef cattle and sheep.

Other Types of Farms. Farms classified as part-time were 13% of all farms, their operators working off the farm at least 150 days of the year, mainly in either the lumber or coal industries. The average amount of business done by these farms was small, being similar to the self-sufficient type except that the operator had more off-farm work. Part-time farms tended to have more grazing land and less crops than self-sufficient farms because of the less labor connected with this system of land use.

A few commercial dairy farms were found mostly in sections near local towns. A small number of commercial poultry farms were scattered throughout the area but were of major importance only in the South Branch Valley in Hardy County.

Records of three farms will help portray the dominant types of farming in this area.

ORGANIZATION OF ONE LIVESTOCK FARM IN POCAHONTAS COUNTY (AREA 3), 1934 (FARM "C")

Acres in Farm	401	*Investment in Farm*	$10,113
Crops	69	Land	6,000
Open pasture	200	Buildings	1,000
Woods pasture	120	Machinery and equipment	285
Farmstead, waste	12	Livestock	2,828

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	8	440 bu.	440 bu.	.....
Wheat	6	180 bu.	80 bu.	100 bu.
Hay (mixed)	40	60 T.	60 T.	.....
Soybean hay	4	8 T.	8 T.	.....
Potatoes	4	800 bu.	50 bu.	750 bu.
Oats	4	180 bu.	180 bu.	.....
Buckwheat	2	39 bu.	9 bu.	30 bu.
Garden, fruits	1	.....	All	.....

Livestock Numbers				
Beef cows	24	20 calves		
Yearlings	24			
2-year-olds	24			20 2-yr. steers
3-year-olds	5			5 3-yr. steers
Bull	1			
Horses	2			
Sows	2	12 pigs	2 hogs	10 hogs
Ewes	100	130 lambs	10 lambs	120 lambs
		640 lbs. wool		640 lb. wool
Chickens	40	350 doz. eggs	140 doz. eggs	210 doz. eggs
		110 chickens	60 chickens	50 chickens

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 54	Wheat 100 bu. @ $1.10	$ 110
Feeds, salt	15	Potatoes 750 bu. @ 75c	562
Fertilizer 2 T.	52	Buckwheat 30 bu. @ $1	30
Lime, 15 T.	45	Steers 16, 500 lb. @ 5c	825
Monthly labor (3 mos.)	99	Lambs 9,600 lb. @ 5.5c	528
Day labor	104	Wool 640 lb. @ 28c	179
Pasture rent	94	Ewes 10 @ $3	30
Miscellaneous	290	Hogs 1,900 lb. @ 7c	133
		Eggs 210 doz. @ 20c	42
	$ 753	Chickens 50 @ 50c	25
			$2,464

Cash Receipts less cash expense = $1,711.

Farm products used by family of 7: 850 gal. milk, 225 lb. butter, 140 doz. eggs, 400 lb. dressed pork, 60 chickens, 50 bu. potatoes, wheat flour and buckwheat flour, apples, peaches, vegetables, small fruits.

Farm "C" illustrates the type of high mountain valley farm producing beef cattle and sheep as the main farm enterprise but having some income from crops. About one-half of the 401 acres in this farm was open rolling pasture, with an additional 120 acres of woods pasture

utilized to some extent by sheep. About 90 acres of land was relatively level bottom land, with 69 acres in crops and 20 acres in good timber. The crop land was a good limestone soil. Good management, with the use of fertilizers and legumes, had maintained or increased the soil productivity. Liberal application of comparatively inexpensive ground limestone to crop and pasture land made legumes a satisfactory crop. One part of the lower land was good potato soil, and was used to advantage in potato production. The investment in this farm was mainly in the value of the land, the dwelling and barns being small and in need of repairs.

Corn, small grains, and mixed hay were used in crop rotation. More than half the crop land was in timothy and clover hay. Additional hay came from the planting of a small acreage of soybeans each year. The portion of the land in row crops was small. Corn ground received 200 lbs. of superphosphate fertilizer per acre each year; wheat land, 125 lbs.; and potato land, 400 pounds of mixed fertilizer per acre. The manure was put on the potato land and garden. In the year of the record, 15 tons of crushed limestone was applied to the hay and pasture land. The open pasture was of good quality. An additional acreage of pasture was rented from an adjoining farm. The yields shown are considerably above average for the area, but are about normal for this farm.

Hereford cattle were kept, and steers were fed and fattened on grass in the pasture season, but fed mostly a maintenance ration of hay, straw, and corn stover in winter. Steers and heifers for beef were usually sold as long two-year-olds. No calves or young beef animals were bought. This farm represents the cow-and-calf system of beef production, which is gaining in popularity with livestock producers.

Hampshire sheep were kept and the ewes and lambs were well cared for during the lambing period. Usually the sheep were grazed on the rougher pasture lands. The ewes were roughed through the winter. The lambs, sold in October, averaged around 80 pounds.

Two horses furnished the power. Corn and small grains were planted by hand. No special potato equipment was used; they were not sprayed, and were dug by plow. The high altitude and soil type is favorable to potato production on this farm.

In addition to the operator's labor, about three months of day labor and three months of monthly labor were hired. No income was derived from the sale of timber during this year, but during some years the sale of mine ties, mine props, and tan bark yields a small income.

All transportation to market was done by hired motor truck, and although this farm is located about 40 miles from a town of any size, a hard surfaced road was only one mile away from the farm.

On farms similar in location to the above, but having less favorable crop land, considerably less livestock could be carried through the winter on the crops which could be raised. The winters in this mountain section are somewhat severe, with heavy snowfall. At least five months of winter feeding is necessary.

ORGANIZATION OF ONE BEEF-CATTLE AND SHEEP FARM IN PENDLETON COUNTY (AREA 3), 1934 (FARM "D")

Acres in Farm	364	*Investment in Farm*	$15,744
Crops	81	Land	7,000
Open pasture	180	Buildings	5,000
Woods pasture	100	Machinery and equipment	1,150
Farmstead, etc.	3	Livestock	2,594

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn for grain	16	880 bu.	880 bu.	.....
Corn for silage	4	38 T.	38 T.	.....
Wheat	17	272 bu.	142 bu.	130 bu.
Rye hay	3	4 T.	4 T.	.....
Alfalfa hay	5	10 T.	10 T.	.....
Mixed hay	35	53 T.	53 T.	.....

Livestock Numbers				
Beef cows	7	1400 gal. milk 5 calves	220 lb. butter	120 lb. butter
*Steers & heifers	32	.....	1 steer	24 steers
Bull	1	.....	.....	.....
Calves	5	.....	.....	.....
Horses	3	.....	.....	.....
Sows	2	12 pigs	4 hogs	8 hogs
Boar	1	.....	.....	.....
Ewes	42	50 lambs 285 lb. wool	.....	40 lambs 10 ewes 285 lb. wool
Chickens	75	600 doz. eggs 65 chickens	200 doz. eggs 25 chickens	400 doz. eggs 40 chickens

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 86	Beef 26,400 lb. @ 5c	$1,320
Fertilizer	20	Pork 1,600 lb. @ 5c	80
Day labor	80	Lambs 3,360 lb. @ 6c	202
Bldg., machine repairs	43	Ewes 10 @ $4	40
Steers bought	525	Wool 285 lb. @ 26c	74
Miscellaneous	145	Chickens 40 @ 50c	20
		Eggs 400 doz. @ 18c	72
	$ 899	Butter 120 lb. @ 20c	24
		Wheat 130 bu. @ $1	130
			$1,962

Cash receipts less cash expenses = $1,063.

Farm products used by family of 11: 800 gal. milk, 220 lb. butter, 550 lb. dressed beef, 450 lb. dressed pork, 25 chickens, 200 doz. eggs, 25 bu. potatoes, garden vegetables and apples.

*Includes 20 feeders bought at 800 lb.

Farm "D" is located in a narrow river valley at an elevation of about 1200 feet. It has a longer pasture season than those on the Allegheny Plateau, although the relatively low rainfall in the local area brings drouth conditions in certain years. About 75 acres of this farm was river bottom land, and subject to overflow during high waters which, however, did not occur frequently. Good drainage prevailed. The soil was of limestone origin and much above average in productivity. The open rolling-to-steep pasture utilized by this farm, on a hillside two

miles from the crop land, was of good quality. Woods pasture was in second-growth timber, not very productive of feed, but was utilized to some extent by sheep.

A good set of buildings in good condition and repair was located at the edge of the bottom land. Good machinery, including tractor, truck, binder, ensilage cutter, and hay loader were well housed.

The crop rotation followed was corn, wheat, and two years of hay, with a small acreage of alfalfa. Timothy and clover gave good yields of hay. The indicated corn yield is about average for this type of land during a normal growing season, but the wheat yield is somewhat low, the average for this type of land being around 25 bushels per acre. Corn was put in the silo in September and fed to cattle and sheep in winter. All of the crops grown, except part of the wheat, was fed to livestock. Fertilizer and ground limestone was applied to the wheat ground and manure spread on the corn ground. Limestone rock, obtained on the farm, was crushed by tractor power available on the farm.

The beef cows were milked part of the year, and 20 steers, of two and three years of age at an average weight of about 800 pounds, were bought in the fall of each year. These steers, in addition to the steers raised on the farm, were fed through the winter on hay, corn stover, and silage, and turned on grass in the spring. Some grain was given during the latter part of the pasture season to add finish. The steers were marketed at an average weight of about 1100 pounds. The ewes were wintered on roughage and given some grain before and during lambing time. The lambs were fed and fattened on grass pasture and marketed in October. The labor with poultry and buttermaking was performed by members of the household, the products being marketed weekly. Livestock was transported to market in the operator's motor truck.

Except for the expense of buying 20 feeder steers, the cash expenses of this farm were relatively low, buying no feed and only a small amount of fertilizer, and hiring only a small amount of day labor during the crop season.

This farm is located 25 miles from a paved road and its location has been a limiting factor in preventing it from going into the commercial dairy business. Farms located farther down the South Branch Valley where milk and cream trucks can readily reach them have shifted from beef cattle to dairying to a considerable extent within recent years. With good crop land to grow feeds, the producing conditions on this farm are favorable to dairying, and the dairy business would probably bring in a greater return from the feed produced than the present beef cattle enterprise. The production of sweet cream for shipment to outside markets will probably come about when more and better roads make this farm, and others similarly situated, easier to reach by truck. The commercial production of poultry and eggs has also been increasing in this valley on farms where marketing is more convenient. Good yields of wheat give a natural poultry feed, thus decreasing the expense for feeds ordinarily purchased on poultry farms.

ORGANIZATION OF ONE BEEF-CATTLE AND SHEEP FARM IN GREENBRIER COUNTY (AREA 3), 1934 (FARM "E")

Acres in Farm	850	*Investment in Farm*	$24,863
Crops	99	Land	16,500
Open pasture	449	Buildings	4,000
Woods pasture	300	Machinery and equipment	610
Farmstead	2	Livestock	3,753

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn for grain	9	540 bu.	540 bu.	.....
Oats	9	360 bu.	360 bu.	.....
Hay	80	120 T.	120 T.	.....
Garden, potatoes	1	.....	All	.....

Livestock Numbers				
Cows	23	20 calves	.....	3 cows
*Steers & heifers	58	.....	.....	40 steers
Calves	20	.....	.....	.....
Ewes	200	220 lambs	.....	190 lambs
		1400 lb. wool	.....	1400 lb. wool
			.....	30 aged ewes
Chickens	50	75 chickens	25 chickens	50 chickens
		400 doz. eggs	200 doz. eggs	200 doz. eggs
Turkeys	20	40 turkeys	.....	40 turkeys
Sows	2	12 pigs	8 hogs	4 hogs
Horses	2	.....	.....	.....

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 122	Steers 40,000 lb. @ 5c	$2,000
Feeds, poultry, calves, 2 T.	65	Cows 3 @ $35	105
Fertilizer 2 T.	55	Lambs 15,200 lb. @ 5.5c	836
Lime 20 T.	50	Ewes, aged, 30 @ $3	90
Labor (12 mos.)	396	Wool 1400 lb. @ 27c	378
Machine, bldg. repairs	150	Chickens 50 @ 50c	25
Labor (90 days)	100	Eggs 200 doz. @ 18c	36
Steers bought 15,000 lb.	600	Turkeys 40 @ $2	80
Miscellaneous	289	Pork 700 lb. @ 5c	35
		Timber, wood	110
	$1,827		$3,695

Cash receipts less cash expenses = $1,868.

Farm products used by family of 9: 1200 lb. dressed pork, 720 gal. milk, 25 chickens, 200 doz. eggs, 40 bu. potatoes, garden vegetables, apples and some small fruits.

*About 20 additional 2-year olds bought each year.

Farm "E" had an unusual amount of bottom land. The open pasture was level to gently rolling, with the woods pasture being situated on the rougher ridge land. Pasture was the principal source of feed for livestock, and the ample supply of good grass provided for the fattening of additional steers above those raised on the farm. The buildings and fences were in excellent repair.

Timothy and clover mixed hay was the principal crop grown. The hay, corn, and oats were grown on level bottom land. The corn and oats were fertilized each year and rotated each year with some of the hay land. The yields here shown are normal for this farm in a reasonably favorable crop year but higher than average for the area, especially

the yields of grain crops. The quality of pasture on this type of land is good and the farming system is based upon pasture. About 20 acres of the land was limed each year at the rate of 2½ tons of ground limestone per acre. Farm power was furnished by a tractor and two horses. All necessary farm machinery was available, including a binder for oats and hay loader with a side-delivery rake.

The beef cattle raised were mainly Hereford-Shorthorn crossbreds. About 20 additional feeder steers usually were bought each year to fatten out on grass, giving a total of about 40 steers and heifers sold as beef each year. They were ordinarily sold as long three-year-olds, at an average weight of around 1000 pounds. The breeding ewes were principally Hampshire and the lambs were entirely grass-fed and fattened, being marketed in October at an average weight of about 80 pounds. Both the beef cattle and sheep were roughed through the winter on good hay, corn stover, and oats straw. The poultry enterprise was carried on by the housewife and the feed expense shown above was mainly for prepared poultry feeds.

In addition to the labor of the operator, one man was hired the year round, and additional day labor amounting to about three months was hired during peak labor loads.

Sales of beef cattle, lambs, ewes, and wool made up nearly 97% of the total cash sales of the farm the year this record was obtained. Changes in the market prices of beef and lambs affect directly the net income to this farm, because a large part of the operating expenses are relatively fixed charges which can be decreased only to a limited extent under any circumstances.

AREA 4—SELF-SUFFICIENT, LIVESTOCK, GENERAL

The elevation of this area varies from more than 3000 feet in the eastern part down to 1500 feet, with the general slope towards the west and south. The farming sections range from 1500 to 2500 feet in elevation. This area as a whole is somewhat similar to Area 3 in topography, being quite mountainous with sharp ridges and mountain ranges, but with less valley land and more steep slopes. Land with an average slope of less than 12% comprises only 16% of the land area. Small patches of relatively level land are found along the Bluestone River in Mercer and Summers Counties, but along the New River in Summers and Fayette Counties there is little valley land. In Raleigh County the Piney Creek and Glade Creek Valleys are rather level, and at the upper end of Marsh Fork there is a relatively large boundary with an average slope between 12 and 25%. Nicholas County has the greatest amount of relatively level land of any of the counties.

Average crop land or good pasture land (Class 3) is found only in the valley of the Gauley River and its tributaries in Nicholas County, but the land immediately adjacent to the river is rough. In general, most of the land in Mercer and Summers Counties, the southeastern part of the area, is below average or poor crop land, and the bulk of the land in Fayette and Nicholas Counties away from the Gauley Valley is either poor crop land, sub-marginal, or forest land.

Land Use. Land in farms in 1930 made up only 40% of all the land surface. The variation in topography and soils is wide within the area, Summers and Mercer Counties having the smoother topography and the greatest amount of land in farms, and Fayette County the least. Crop land was 23% of all land in farms; pasture land, 43%; and woodland not pastured, 29%. The pasture land was made up of 72% open and 28% woodland pasture. As in Area 3, the land in crops is confined mainly to the bottom lands and slopes along streams, or to the flat table lands on the tops of ridges or mountains.

Crops. The rough topography makes crop rotation difficult on a majority of farms. With an average of 17 acres of crop land per farm, a definite rotation is followed on few farms and these have more crop land than average. The cropped land in many sections has a slope so great as to make certain crops preferred to others because of the necessity of growing them with hand labor. All things considered, corn gives better current returns on the steeper land than hay. Seeding and harvesting a hay crop involves a large amount of hand labor on land too steep for plowing and the use of a mowing machine. In 1929, corn was 26% of all crop land; wheat and oats, 19%; and hay, 38%. For the area as a whole, the average size of farm was 77 acres in 1930, indicating that with only 23% of the farm land in crops, and with insufficient acres for extensive pasture, the average size of business was necessarily small. The percent of the farm land in corn was uniform in all counties in the area, with the general tendency to have the greatest percentage of land in corn in the less favored agricultural sections. Timothy and clover mixed made up the bulk of the hay acreage. With soil conditions generally not favorable to clover, a large percentage of the mixture was timothy, Wheat acreage was found mainly in the southeastern part, in Mercer and Summers Counties, where the soil is relatively more favorable to the crop. The average acreage of wheat per farm was low, however, and the total acreage decreased about 70% between 1919 and 1929. Average yields of wheat were relatively low compared with yields on the good wheat soils in Area 1. The acreage of oats remains relatively constant, with about three-fourths of the crop being cut and fed unthreshed. In the higher elevations in Raleigh and Nicholas Counties, small acreages of buckwheat were grown. Although 10% of the crop land was in orchards in 1929, these were of little commercial importance and the quality of the apples produced on the neglected trees was low. Although only 3% of the crop land was in potatoes, they were grown on 84% of all farms in 1929. One-half acre was the average acreage per farm, the crop being used mainly for home consumption. In Nicholas County, in the higher altitudes and on suitable soil, a few farms raised potatoes in considerable quantities to be sold commercially.

Livestock. The principal livestock in the area are cattle, sheep, and poultry. The total numbers of cattle decreased from 1910 to 1930 except in those sections in and near the coal fields. In these sections

cows kept for dairy purposes have increased in response to the local market for dairy products. Dairy cows also contribute a considerable part of the value of the family living from the farm. In general, the quality of the cattle was not high. Except in Nicholas County, where rough pastures are more prevalent than in other sections, the numbers of sheep declined greatly between the years 1910 and 1930. Pastures available in Nicholas, Summers, and Mercer Counties make possible a greater number of sheep and cattle per farm than in Raleigh and Fayette Counties, but even in these counties the pasture was relatively poor and the average farm did not have sufficient for any considerable number of either cattle or sheep. The limited production of grains restricts the numbers of poultry in the area. In Summers County, with wheat and oats produced more generally, chickens were found in greatest numbers. The average size of flock ranged between 30 and 40 chickens per farm, and the eggs and meat consumed by the farm family constituted the major part of the income from this enterprise. There were fewer hogs per farm in this area than in Area 3, but farm-butchered pork and pork products were of major importance in the farm family living.

Sources of Income and Types of Farms. The gross farm income in 1929 for the area was derived from the following sources: sales of livestock, 19%; livestock products, 21%; crops, 10%; and the value of products used by the operator's family, 46%. Dairy products contributed about one-half of the total value of livestock products sold, eggs one-third, and chickens and wool the remainder. In sections where local markets were more readily available, as in the coal areas of Fayette, Raleigh, and Mercer Counties, whole milk and butter were sold in small quantities, and some few commercial dairies were found. In Nicholas and Summers Counties eggs and poultry were more important sources of income than dairying, and, in Nicholas County, the sale of livestock was of more importance than in any other section of the area.

Self-Sufficient Farms. Farms classed as self-sufficient were 45% of the total number of farms in the area in 1929; they occupied 40% of the farm land and earned 35% of the gross income, The greatest number of self-sufficient farms was in sections nearest to the coal mining regions in Raleigh and Fayette Counties. The value of farm products used by the operators' families was 69% of the total gross income. Self-sufficient farms in this area were quite similar to those in Area 3 except that they had less acreage per farm, grew a greater quantity of crops for sale, and depended less upon livestock as a source of income. The cash income to these farms in 1929 ranged from $171 in Nicholas County to $208 in Mercer County, this cash income on the average being from crops, 25%; livestock, 27%; and livestock products, 45%.

Part-Time Farms. These farms were relatively small in size, averaging about 50 acres, and their operators spent at least 150 days working off the farm, mainly in coal mining and lumber-mill work.

Part-time farms were 22% of all farms in the area and their organizations differed from that of self-sufficient farms in that they sold proportionately more livestock and less livestock products.

General Farms. In 1929, 1548 farms, 17% of the total, had no single source of income equal to 40% of total income and were, therefore, classed as general farms. Their average size was about 105 acres, being smallest in Fayette County with 77 acres and largest in Summers with 127 acres. The general farms were those usually having more than the average amount of crop land and were the better farms from the standpoint both of quality of land and operation. Practically the only markets available are in the local towns. These farmers carried on a good-sized business on a rather intensive scale, partly supplying the local demand for vegetables, potatoes, and dairy and poultry products. The sale of crops and livestock each accounted for between 25 and 30% of the cash income, and the sale of dairy products, eggs, and chickens around 40%.

Specialized Livestock Farms. The specialized livestock farms in this area were located mainly in Nicholas, Summers, and Mercer Counties where the native pastures were sufficient to support livestock. These farms were similar to those in Area 3 except for being smaller on the average and having less income per farm. The sale of livestock was the main source of cash income, but because of the local markets prevailing for dairy and poultry products, these enterprises provided a higher proportion of the income than in Area 3.

Following is the record and description of one of the better part-time farms in the area.

ORGANIZATION OF ONE PART-TIME FARM IN SUMMERS COUNTY (AREA 4), 1934 (FARM "F")

Acres in Farm	45	*Investment in Farm*	$2,095
Crops	12	Land	1,200
Open pasture	8	Buildings	600
Woods pasture	22	Machinery and equipment	115
Farmstead, waste	3	Livestock	180

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	3	90 bu.	90 bu.	.....
Oat hay	2	2 T.	2 T.	.....
Wheat	3	54 bu.	54 bu.	.....
Hay	3	3 T.	3 T.	.....
Garden, fruits	1	.....	.....	$30

Livestock Numbers				
Dairy cows	3	3 calves	.....	2 calves 1 cow
Dairy heifers	1	400 lb. butter	100 lb. butter	300 lb. butter
Calves	1	$43 cream	.....	$43 cream
Pigs	2	.....	2 hogs	.....
Chickens	75	125 chickens 800 doz. eggs	50 chickens 100 doz. eggs	75 chickens 700 doz. eggs
Turkeys	10	20 turkeys	.....	20 turkeys

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 11	Yearling calves, 2 @ $15	$ 30
Feeds, poultry, dairy 2½ T.	75	Dairy cow @ $35	35
Fertilizer 1 T.	17	Eggs 700 doz. @ 20c	140
Machine & horse work hired	25	Chickens 75 @ 60c	45
Miscellaneous	34	Turkeys 20 @ $2.20	44
	$162	Butter 300 lb. @ 22c	66
		Cream	43
		Truck	30
		Off farm work	300
			$733

Cash receipts less cash expenses = $571.00.
Farm products used by family of 3: wheat flour, corn grits and meal, 350 gal. milk, 100 lb. butter, 100 doz. eggs, 50 chickens, 400 lb. dressed pork, garden vegetables, apples, peaches and small fruits.

Farm "F" is indicative of the better part-time farms in the rough areas near enough to coal mines, lumber mills, and other industries to give off-farm employment. About one-half of this farmer's time was spent in off-farm work as a carpenter and mechanic.

The farm was located on rolling to steep land, the crop land being confined to the smoother slopes which were limited in extent. The total investment was relatively low, the frame dwelling and barn being small but in reasonably good repair. Some semblance of a rotation of corn, small grain, and hay was attempted, but the limitations in slope made rotation difficult. No horses were kept, the plowing and necessary machine work being hired from neighbors. All crops produced, except garden crops and fruits, were fed to the dairy herd, pigs, and poultry, and in addition 2½ tons of poultry and dairy feeds were bought. Rather low quality dairy cows were kept, but the poultry flock was of good quality and was well fed, producing somewhat better than average. One dairy heifer came into production each year and either a cow or heifer was sold inasmuch as the feed produced was not sufficient to care for an increase in the number of cows. The manure was usually spread upon the corn ground and garden, and fertilizer was applied to corn, oats, wheat, and garden.

The housewife attended to the poultry and dairy enterprises except cleaning house and barn and doing the milking. The poultry, eggs, butter, and cream were marketed in a town seven miles away, four miles of which was over dirt roads.

The efficiency of the housewife in handling the dairy products and the poultry enterprise on this farm was above average and accounts for the above-average returns to these enterprises. With better-quality dairy cows, the income from the dairy business could be increased to some extent. The income from off-farm work of the operator was about $300 per year, fluctuating considerably according to the amount of building going on in the surrounding community.

The above farm is an example of the part-time farm where crop and pasture acreage is limited and where an intensive type of livestock production must be followed. In sections having a topography and

soil suitable to the growth of only relatively poor pasture, part-time farms consist of a small crop acreage with a rather large acreage of pasture, and beef cattle and sheep are kept. They require very little labor during the pasture season, are fed roughage in the winter and the beef steers may be sold as long one- or two-year-olds going into more favorable pasture areas to be grass-fattened. The lambs are grass-fed entirely and sold at relatively light weights. A considerable number of cattle and sheep can be cared for in such a manner by part-time labor, and on the average, the income to this type of part-time farm is greater than that of the intensive type here illusrated.

AREA 5 { 5A—SELF-SUFFICING LIVESTOCK, PART-TIME / 5B—SELF-SUFFICING CROP, PART-TIME

This area comprises that section of the state where the physical conditions are such as to prohibit any considerable amount of commercial agriculture. Most of the land in the area, either because of topography or soil, or both, is suitable only for forest land, and much of it is now covered with second-growth timber or brush. The general elevation lies between 1500 and 2500 feet, being the highest in the eastern part and sloping towards the south and west to the Ohio River. Mountain ridges in the eastern part of the area rise to nearly 3000 feet. The land surface is characterized by violent changes in elevation within local areas, with steep-sided ridges being separated by narrow and winding gullies. There is very little level land either in the river valleys or on top of the ridges. For the area as a whole only 7% of the land has a slope of less than 12%, and 50% has an average slope of more than 40%. The land surface is somewhat less rough in the western part of the area, but all counties except Webster have more than 80% of the land area with a slope of more than 25%. Less than 10% of the land in any county had a slope of less than 12%. The Guyandot River, flowing through the area, has practically no valley land adjacent. The largest area of level land is along Clear Fork Creek in Wyoming County. In the section south of Clay County, the great limestone deficiency in the soil hinders the growth of natural pasture on those lands which lie level enough to be pastured and, therefore, the relatively small numbers of livestock depend mainly upon farm crops as a source of feed.

Some poor crop land (Class 5) is found in that western part of Wayne County falling in this area, and some submarginal crop land in Calhoun County. It is obvious that the agriculture is carried on under severe physical handicaps, and hand methods of production are the only possible means of utilizing most of the land which is in crops. The area contains highly developed coal-mining sections, and the concentrations of population, especially in rural non-farm communities, is the greatest of any area of the state.

Land Use. The percentage of the land in farms varied from 15% in Mingo County to 69% in Lincoln County. The percentage of the farm land in crops was relatively uniform for the entire area,

varying only from 19% in Mingo to 23% in Clay. In the more northern sections, approaching Areas 3 and 8, more of the farm land was in pasture and less in woods than in the rougher southern sections. With the exception of Calhoun, Clay, and Wayne Counties, between 50 and 60% of all farm land was in woodland.

Crops. The smallness of fields plus the rough topography makes regular crop rotations impractical. The percentage of crop land in corn was highest in the sections of most restricted crop land. Although the percentage of farm land in crops was rather uniform in all sections, the systems of farming vary somewhat within the area and the percentage of the land in the various crops varies widely. In general, Webster and Calhoun Counties and the northern half of Clay County (5A), although having a highly self-sufficient type of farming, follow a system of farming based primarily upon livestock pasturing, with hay acreage being over 50% of all crop land, and the percentage of the crop land in corn being similar to that of Area 4. The soils in this northern section of the area are less deficient in limestone than in the southern part, and although the topography is very rough, a considerable part of the farm land has been cleared, and native pasture of relatively low quality is the major source of livestock feed. In the southern section (5B), livestock production is limited because of very poor pastures and rough topography. If the families on the land are to receive the largest returns from the limited amount of crop land, it will be necessary to adopt intensive rather than extensive cultural practice. Under these conditions, hay acreage is relatively low, rarely being over 15% of the crop land, and corn acreage is relatively high because corn can be grown and harvested successfully by hand methods on land too steep for almost any other crop. It will return the greatest amount of food and feed per acre of any crop which might be grown. *The more limited the crop land, the greater the percentage of crop land in corn.* This system of cropping, however, greatly increases the hazards of erosion and hastens soil depletion. In sections of greatly restricted crop acreage, potato acreage is next in importance to corn, but the acreage in garden produce and vegetables occupy a relatively large percentage of the land in crops. As the land upon which crops can be grown becomes greater, in different sections of the area, oats and hay occupy a correspondingly larger proportion of the crop land. In Logan and Mingo Counties, where crop acreage is most limited, about 78% of all crop land was in corn, potatoes, and garden vegetables in 1929. Farm orchards occupied better than 10% of the crop land but were of little importance except for supplying the farm family with low-quality fruit, mainly apples.

Livestock. In Area 5A, which includes most of Calhoun, Webster, and the northern half of Clay County, where pasture provides a considerable amount of feed, some beef cattle and sheep are kept in addition to the other livestock used mainly as a source of products for family living. In Area 5B, however, where there is very little productive pasture acreage, as well as limited production of grains and hay, the livestock is kept almost entirely for supplying food for the family.

Horses or mules are on about two-thirds of all farms. These with the milk cows use up the available hay and pasture. Cows for dairy production were reported on about 70% of all farms, and hogs for farm butchering on about half of the farms. Less than 10% of the farms, in any county, reported the breeding of hogs. The few pigs which are produced are sold to other farmers in the community. The numbers of hogs in the more restricted feed areas have declined as much as 75% since the peak in numbers between 1900 and 1910, but pork and pork products still make up the bulk of the meat used by the family. Chickens were kept on about 90% of all farms in 1929, the average number per farm ranging between 25 and 35.

Sources of Income and Types of Farms. For the area as a whole, the average gross income per farm in 1929 was $600. The value of products used by the operator's family, however, was $355 or 59% of the gross income, leaving an average cash income of $245. This cash income was derived from the following sources: crops, chiefly tobacco and truck crops, 28%; livestock, 30%; livestock products, 34%; and forest products, 8%. Eggs and chickens made up 70% of the value of livestock products sold and dairy products 30%. The proportion of income from crops was greatest in the southern section of the area where feed production for livestock was greatly restricted but where some tobacco was grown. In local areas near to population centers the dairy enterprise was of more importance than in sections farther removed from market. Generally speaking, the supply of whole milk for cities and villages was furnished by commercial dairies purchasing a large part of both the grain and roughage from outside the area.

General Farms. The 1316 general farms, or 10% of all farms, aside from a small number of specialized farms, were the best ones in the area. They were situated in the more favored local sections with an opportunity to do a greater volume of business than the average. Their gross income per farm was about double that of self-sufficient farms and the value of products used by the operator's family made up only about 37% of the gross income. The difference between general and self-sufficient farms was mainly in size of business, their sources of cash income being quite similar.

Self-Sufficient and Part-Time Farms. For the area as a whole, self-sufficient farms were 56% and part-time farms 20% of all farms. These two types of farms were quite similar in general organization, and their gross income was about $550 per farm in 1929. The value of farm products used by the operator's family amounted to approximately 75% of the gross income, leaving a cash income ranging from $101 per farm in Mingo County to $173 in Boone. The labor required to operate a farm of this kind makes it possible for the operator to work off the farm a considerable part of the time, if work is available. It is obvious that with this low cash income from the farm, some returns for off-farm work are needed if the family is to have a standard of

living much above subsistence. When employment off the farm is not available the farm people on a majority of the farms of this area face an almost hopeless task in making a living. They are affected less by the general agricultural situation and prices than by industrial conditions in their community.

ORGANIZATION OF ONE SELF-SUFFICING FARM IN AREA 5, 1934 (FARM "G")

Acres in Farm	64	*Investment in Farm*	$1,937
Crops	19	Land	700
Open pasture	23	Buildings	900
Woods not pastured	20	Machinery and equipment	110
Farmstead, etc.	2	Livestock	227

Crop Acres	19	*Production*	*Farm Use*	*For Sale*
Corn	4	120 bu.	120 bu.	.....
Oats	3	2 T.	2 T.	.....
Buckwheat	4	60 bu.	60 bu.	.....
Hay	6	3 T.	3 T.	.....
Potatoes, garden	1	.....	.....	$50 vegetables 20 bu. potatoes
Apples	1	150 bu.	50 bu.	100 bu.

Livestock Numbers				
Dairy cows	2	2 calves 1200 gal. milk	200 gal. milk 100 lb. butter	250 lb. butter
Steers & heifers	4	.....	.....	1 beef
Hogs	2	.....	.....	.....
Chickens	40	50 chickens 475 doz. eggs	20 chickens 75 doz. eggs	30 chickens 400 doz. eggs

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$11	Potatoes 20 bu. @ $1	$20
Fertilizer ½ T.	15	Vegetables from garden	50
Feeds, poultry	10	Apples 100 bu. @ 50c	50
Bldg., fence repairs	25	Beef, 700 lb. @ 5c	35
Other cash	20	Butter 250 lb. @ 25c	62.50
	$81	Eggs 400 doz. @ 20c	80
		Chickens 30 @ 50c	15
		Work off farm	70
			$382.50

Cash receipts less cash expenses = $301.50.

Farm products used by family of 4: 40 bu. potatoes, corn for meal and grits, buckwheat for flour, 550 lb. dressed pork, 20 chickens, 100 lb. butter, 200 gal. milk, 75 doz. eggs, apples and small fruits, vegetables from garden.

Farm "G" is located on an upland ridge at an altitude of about 2500 feet, with the topography rolling and rough. Crops are grown on the more level portions of the land at the top of the ridge. The pasture land is rough and steep, and the pasture is of poor quality. Some attempt is made to rotate crops of corn, oats, and hay, but in the year indicated the corn acreage was in two separate fields, the hay, also, in two, with buckwheat on the least favorable locations in three separate plots of ground. All crops were planted by hand and corn was culti-

vated by a one-horse plow when the slope of the fields was not too steep. Oats were cut with a cradle and the sheaves fed unthreshed. Fertilizer was applied to corn, oats, and garden acreage, and a small amount of manure was spread on the garden and potatoes, which were on relatively level ground.

The cows were of mixed breed, Holstein predominating with Shorthorn, giving a fair beef steer. The steers were roughed through the winter on corn stover and oats sheaves and then pastured. Two pigs were bought each year, fattened out to heavy weights, and then butchered for family consumption. Good quality chickens were kept. Eggs, chickens, butter, fruits, and vegetables were marketed in a mining town 16 miles distant.

This farm illustrates the type of organization and operation found on a large number of farms in Area 4, and the northern part of Area 5, where pasture is good enough to be utilized by livestock. The quality of livestock on this farm, however, was above average for this type of farm, and the production per unit was also above average. The prices received for products were above average also, because the products were marketed directly to consumers. The sale of apples, also, was not typical of this area. On many of these small farms an acre or two of potatoes may be grown as a cash crop, and although the yields per acre are below that in the sections where spraying and good production methods are practiced, the income from the small production is a large addition to the farm income.

AREA 6—CITY AREAS, SELF-SUFFICING, DAIRY

With the handicaps of a very limited amount of good soil, and a rough topography, the agriculture in Area 6, comprising the sections around the cities of Charleston and Huntington, is primarily of a self-sufficient type. The kind of farm products sold are determined mainly by the markets existing in the cities. Without the influence of the large population centers of Charleston and Huntington, the agriculture would be little different from that found in Area 5. These nearby markets make it possible to pursue a type of farming for which the physical factors are none too favorable. Most of the area in farms has an elevation of between 500 and 1000 feet, but in the eastern part of Kanawha County the elevation rises to around 1500 feet. Only 13% of the land in the area has a slope of less than 12%, and 83% has a slope greater than 25%.

Above-average crop land (Class 2) is found only in the Kanawha River bottom land, with below-average crop land (Class 4) being found along the Elk River. That part of Teay's Valley situated in this area is average crop land (Class 3), but most of the remainder of the area is either poor or submarginal crop land or forest land. Most of the Ohio River bottom lands, which within this area, are limited in extent, are city or industrial areas.

CHARLESTON AREA

Land Use. Within the area surrounding the City of Charleston the topography varies widely and the farm land is mainly located along the narrow valley of the Kanawha River and in the valley of the Elk River, which flows into the Kanawha from the north. Land suitable for crops is very limited and the land which can be used for any farm purpose is only a small percent of the land area, especially in the section in Kanawha County through which the Kanawha River flows. The section along Elk River is used to a greater extent for pasture, but crop land in this section is also very limited. Crop land per farm in the area varied from an average of 11 acres in Cabin Creek District to 17 acres in Landon District in 1929. Corn occupied about one-third of the crop land; hay, one-third; oats, 12%; and potatoes, vegetable crops and orchards, the remainder. The attempt to grow at least a part of the roughage for the dairy herd accounts for the relatively large acreage in hay.

Dairy cows and poultry were the two most important livestock enterprises because their products command a price usually sufficiently high to justify purchasing grains and concentrates for feeding them. Hogs were grown only for farm consumption. The available pasture is used for dairy cows, and, therefore, sheep and beef cattle are not generally found on the farms.

Sources of Incomes and Types of Farms. In 1929 the sales of dairy products, mainly whole milk, provided nearly one-half of the total cash receipts of the area, and eggs and poultry made up about 20%. Potatoes, truck crops, and apples were the main crops sold, and calves and cull cows from the dairy herds made up the main part of the livestock sales. The value of farm products used by the operator's family represented about 40% of the total value of all products produced in 1929.

Self-Sufficient and Part-Time Farms. In 1929, in Kanawha County, 50% of all farms were of the self-sufficient type and 19% were part-time. The commercial agriculture of the area was carried on mainly by the relatively small number of general, dairy, poultry, truck, and fruit farms in the various sections. Self-sufficient and part-time farms received about 40% of the total cash income of the area, and the specialized farms the remainder. The organization of the self-sufficient and part-time farms is determined mainly by the size, topography, and soils of the individual farms. Farms having some pasture land tend to keep cows which produce surplus milk to sell as butter or butterfat. Farms with a limited acreage of good crop land and with little or no pasture produced vegetables, potatoes, fruits, and berries, keeping a cow only to produce milk for the family. A high percentage of these types of farms sold surplus eggs and poultry from the farm flocks. The volume of business done by these farmers was small, and the income from off-farm work was usually of great importance to the family.

Dairy Farms. Dairy farms were the most important commercial farms in the area, although their number was small. A majority of them bought nearly all the grains and concentrates fed to cows, and many bought a considerable part of the roughage. Few dairy farms carried on other farm enterprises, practically all of their income being from the sale of milk.

General Farms. General farms in the area were similar in organization to the self-sufficient farms. They usually had a greater amount of crop land than the self-sufficient farms and did a greater volume of business per farm.

HUNTINGTON AREA

Land Use. The quantity of farm land around the City of Huntington is much greater than in the area around Charleston, with a higher percentage of the land in farms. The quality of the soil, however, is not high, and outside of the Ohio River bottom lands, the yields per acre of most crops are relatively low. Although the topography is rather rough and hilly, it is in general more level than around Charleston. In the area around Huntington, the crop land in 1929 was about 30% of all farm land; pasture, 36%; and woodland not pastured, 29%. The average crop acres per farm was about 20 in 1929, with 43% of this corn, 6% in oats, 25% in hay, about 5% in potatoes and vegetables, and 14% in farm orchard.

Dairying and poultry were the two most important livestock enterprises. Dairying was responsible for somewhat more than 30% of the cash farm income in 1929, and poultry 19%. Very few beef cattle and sheep are found in the area. The numbers of dairy cattle have remained rather constant during the past 20 years, but the quality of cows has improved. The fact that relatively more favorable producing areas for dairy products exist in Ohio, within hauling distance of Huntington, has tended to prevent expansion of dairying in this area. Hogs were kept on a majority of farms for home butchering but were of minor commercial importance. In 1929, 70% of all eggs produced in the county were sold, and 47% of all milk produced was sold as whole milk, with relatively small amounts sold as cream, butter, and butterfat.

Sources of Income and Types of Farms. In Cabell County, crop sales, including tobacco, amounted to 39% of all cash income in 1929; livestock, 12%; and livestock products, 49%. The value of products used by the operator's family was 37% of the gross income.

In this area self-sufficient and part-time farms made up 68% of all farms in 1929, but received only 35% of the total cash farm income. General farms made up 16% of all farms and the remainder were mainly specialized dairy, poultry, truck, fruit, and tobacco farms. With the exception of the inclusion of tobacco as a cash crop on the general farms the systems of farming and sources of income are similar to the Charleston area. The fruit, dairy, and poultry farms were specialized farms with the one source of income yielding 80 to 90% of all cash income.

Following is the record and description of the organization of a commercial dairy farm in Kanawha County.

ORGANIZATION OF ONE COMMERCIAL DAIRY FARM IN KANAWHA COUNTY (AREA 6), 1934 (FARM "H")

Acres in Farm	398	*Investment in Farm*	$11,321
Crops	48	Land	6,000
Open pasture	215	Buildings	3,000
Woods pasture	80	Machinery and equipment	560
Farmstead, brush, waste	55	Livestock	1,761

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	12	300 bu.	300 bu.	.....
Soybean hay	5	8 T.	8 T.	.....
Mixed hay	30	35 T.	35 T.	.....
Garden, potatoes	1	.....	All	.....

Livestock Numbers				
Dairy cows	36	32 calves	.....	4 cows
		22,700 gal. milk	1,200 gal. milk	21,500 gal. milk
Dairy heifers	11	.....	.....	2 heifers
Bull	1	.....	.....	.....
Horses	3	.....	.....	.....
Chickens	100	650 doz. eggs	300 doz. eggs	350 doz. eggs
		50 chickens	25 chickens	25 chickens

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 39	Milk 21,500 gal. @ 16c	$3,440
Feeds, dairy, 36 T.	1,224	Cows 4 @ $20	80
Milk hauling	240	Heifers 2 @ $25	50
Labor hired (12 mos.)	276	Eggs 350 doz. @ 15c	53
Pigs, 3	30	Chickens 25 @ 40c	10
Miscellaneous	148		
	$1,957		$3,633

Cash receipts less cash expenses = $1,676.

Farm products used by family of 5: 600 gal. milk, 200 lb. butter, 675 lb. pork, 25 chickens, 300 doz. eggs, 25 bu. potatoes, corn grits and meal, garden vegetables, and apples.

Farm "H" is typical of the commercial dairy farms in this area, where crop land is limited and pasture land is usually rough and steep. The crop land is comparatively good soil but has been impoverished by poor cropping practices in the past. On this farm the present cropping system, having a high percentage of the land in legume hay, and the return of the manure to the land, will lead to soil improvement. Pastures in this area usually have a low carrying capacity except where they are on the bottom land. On this farm the pastures were all on upland slopes, having only a light stand of grass.

The dairy cows were of average-to-good-quality mixed breeds, with Holsteins predominating. Enough calves for replacement purposes were kept. The remainder were either sold, killed, or given away shortly after birth. The shortage of farm-grown feeds leads to buying all replacement cows for the dairy herds on many farms in this area. Because of the limited acreage of grains, most of the concentrate feed

is purchased, and on many farms a considerable part of the roughage is also purchased. On this farm more than 80% of all concentrate livestock feeds was purchased, and the corn stover was fed to increase the limited supply of hay available.

In 1934 purchased feed equalled 55% and hired labor 25% of the total cash expenses. The milk sold was picked up at the farm by truck and delivered to a plant in the city where it was pasteurized before distribution to consumers. Except for the dairy enterprise, the only source of receipts was a poultry flock cared for by the housewife. Three pigs were purchased and fed to slaughter weights and killed for family consumption.

AREA 7—TOBACCO, SELF-SUFFICING, GENERAL

Area 7 is small in extent comprising contiguous parts of Mason, Putnam, Lincoln, and Cabell Counties. It is the only section of the state where tobacco production is of importance, but even here tobacco acreage per farm is small. The Burley types of tobacco are grown and in recent years the acreage has decreased greatly but is apparently on the increase again beginning in 1937.

Land with an average slope of less than 12% is 21% of the land area, and 58% of the land has a slope of more than 25%. The largest areas of level land are along the Ohio and Kanawha Rivers. In general the area has a rough topography, smoothing out in the river valleys, with outcroppings of very rough lands well scattered through the area.

The only section of best crop land (Class 1) is along the Ohio River in Mason County but this is limited in extent. In general the area has below-average, poor, or submarginal crop land. A large section of below-average crop land (but relatively good land for this area) is found between the Kanawha River and Teays Valley in Putnam County. Although the land in Area 7 has a topography similar to the pasture areas in the state, soil conditions are such that natural pasture grasses do not flourish.

Land Use. Even though 58% of the land area has an average slope of over 25%, 85% of the total land area was in farms in 1930. In spite of the hilly topography crops occupied around 20% of the land in farms. In the northern section of the area soil conditions are more favorable to natural pasture, but in the southern section native grass pasture is poor and a relatively small percentage of the land is in pasture. Corn occupied about 40% of the crop land in 1929; hay, 30%; oats, 7%; tobacco, 5%; and farm orchards, 10%. A small amount of wheat was found in the northern part of the area. Livestock consisted mainly of cows for dairy purposes and poultry, with some beef cattle in the better pasture sections in Mason County. Hogs are grown mainly for farm family consumption. The general lack of good pasture limits the numbers of sheep.

Sources of Income and Types of Farms. In the southern part of the area the income from the sale of crops, mainly tobacco, was

about one-half the total cash income on all types of farms, that from livestock products one-third, and that from livestock the remainder. In the northern section, where there is more livestock, crop sales were about one-third the total cash income; livestock sales, one-third; and livestock products, one-third. The value of farm products used by the operator's family was about one-third of the average gross income of all farms.

Farms classed as self-sufficient were 33% of all farms in 1929; general farms and tobacco farms, 21% each; part-time farms, 10%; the remainder being mostly specialized dairy, poultry, livestock, and fruit farms.

Self-Sufficient and Part-Time Farms. Self-sufficient farms were of the same general nature as those in Area 5, except that tobacco sales were a considerable part of the total crop sales. Gross incomes per farm were around $500, with two-thirds of this being the value of products used by the operator's family.

Tobacco Farms and General. Tobacco farms were specialized to such an extent that on the average more than 80% of their income was from the sale of crops, mostly tobacco. These were 21% of all farms in the area. Their average acreage per farm was about 100 acres, but a relatively small percentage of the crop land was in tobacco. The income from the sale of livestock was about 6% of all cash income, and from livestock products about 12%. Although the specialized tobacco farms made up only 21% of all farms in the area, some tobacco acreage was found on a majority of the farms. On general farms crop sales amounted to about 40% of all cash receipts, livestock sales approximately 20%, and sales of livestock products 40%. The general farms were about the same average size and had approximately the same amount of cash income as the tobacco farms. They had less tobacco acreage and more acres of pasture and hay for livestock.

The organization of tobacco farm "I" illustrates the type of farm upon which tobacco was produced in Area 7. It is located on hill land but the yields of crops were about average for the area because of the good crop practices followed. The acreage of tobacco is above average for farms growing tobacco in the area. The large acreage of pasture, atlhough relatively poor, made it possible for livestock to be grazed in the pasture season and enough hay and grain was grown for good winter feeding. Although tobacco acreage was only a small part of the total land in crops, tobacco sales provided a large part of the total farm receipts. Changes in tobacco prices materially affect the income of this type of farm. The lower-than-average price in 1934 decreased its cash income considerably.

Following is the record and description of the organization of a tobacco farm in Putnam County.

ORGANIZATION OF ONE TOBACCO FARM IN PUTNAM COUNTY (AREA 7), 1934 (FARM "I")

Acres in Farm	160	*Investment in Farm*	$3,478
Crops	32	Land	1,700
Open pasture	90	Buildings	1,300
Woods not pastured	26	Machinery and equipment	183
Farmstead, waste	12	Livestock	295

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	12	360 bu.	360 bu.	.....
Wheat	3	54 bu.	54 bu.	.....
Oat hay	4	2 T.	2 T.	.....
Timothy hay	8	10 T.	10 T.	.....
Tobacco	3½	3520 lb.	.....	3520 lb.
Potatoes, garden fruit	1½	.....	All	.....
Livestock Numbers				
Cows	3	3 calves	.....	2 calves
		240 lb. butter	240 lb. butter	.....
		500 gal. milk	500 gal. milk	.....
Heifers	2	.....	.....	1 heifer
Calves	1	.....	.....	.....
Sow	1	6 pigs	4 pigs	2 pigs
Pigs	4	.....	.....	.....
Chickens	60	480 doz. eggs	120 doz. eggs	360 doz. eggs
		100 chickens	40 chickens	60 chickens

Cash Expenses		*Cash Receipts*	
Taxes	$ 94	Tobacco 3520 lb. @ 10c	$352
Fertilizer 750 lb.	9	Heifer	35
Labor, day	40	Calves, 2	23
Other cash	72	Chickens 60 @ 60c	36
		Eggs 360 doz. @ 18c	65
	$215	Pigs 2 @ $10	20
			$531

Cash receipts less cash expenses = $316.

Farm products used by family of 9: 15 bu. wheat for flour, 40 bu. potatoes, 700 lb. dressed pork, 240 lb. butter, 500 gal. milk, 120 doz. eggs, 40 chickens, apples, peaches, and vegetables from a good garden.

AREA 8—LIVESTOCK GRAZING, SELF-SUFFICING, DAIRY PRODUCTS

The elevation of this area is from 500 to 1000 feet in the western part near the Ohio River and rises towards the eastern edge to nearly 2000 feet in Barbour and Upshur Counties. For the area as a whole, land having an average slope of less than 12% is 11% of the land area, and that with a slope of over 25% is 75% of the land area. In general the topography in all parts of the area is quite similar, being very rolling to hilly, with the relatively level land either in the river valleys or on the hilltops adjacent to them. The greatest amount of relatively smooth land is in the eastern sections, with the topography getting rougher towards the westward. There are no river valleys to give any considerable amount of level land in the western section. In Taylor, Barbour, and Upshur Counties land with a slope of less than

25% makes up more than one-half of the land area, but in Roane, Wirt, and Gilmer Counties it is less than 10%. In the western sections a higher percentage of the land is very rough; in Roane County, for example, 47% of all the land area has a slope of more than 40%. A large area of rough land is also located in northwestern Braxton County, extending into portions of Lewis and Gilmer Counties.

A small amount of above average crop land is found in Wirt County along the Little Kanawha and Reedy Creek, bordered by some average crop land. Some average crop land (Class 3) is found along the West Fork River in Harrison and Lewis Counties, with a large area of above-average pasture land (Class 4) between the West Fork and the Monongahela Rivers. In general, the best land in the area is in the valleys and the hills contiguous to the Monongahela River in the eastern half of the area. Average pasture land or poor crop land (Class 5) predominates in the western half of the area, with some small patches of above-average pasture land along local streams. Very little Ohio River bottom land is found in Jackson County where the area borders the Ohio River, but there is some good bottom land in Mason County.

Land Use. In 1929, 82.4% of the land surface in the counties included in this area was in farms, varying from 73% in Ritchie County to 92% in Jackson. With 75% of the land area having a slope of 25% and over, it is obvious that the land which can be put into crops is limited. Crop land was 19% of all farm land in 1929, varying from 14% in Doddridge County to 22% in Jackson. Pasture land was 63% of the land in farms, varying from 55% in the southern border of the area to 71% in Lewis County. Only 10% of the land in farms was woodland pasture, and woodland not pastured was 16%, leaving 53% in open pasture. In the best pasture areas in Harrison and Lewis Counties as much as two-thirds of the farm land is in open pasture, with very little woodland.

Although the topography in this area is quite rough, the hillsides upon which most of the farming is carried on are rather long and relatively free from rock outcroppings. Where the land has not been plowed the natural grass cover has prevented the more noticeable forms of soil erosion, but sheet erosion has reached serious proportions. On many farms, however, especially in the western half of the area, land on steep hillsides, which is suitable only for pasture or woods, has been broken and cropped. Once the land has been broken and the sod cover destroyed, the soil types are such as to erode badly. The loss of a large part of the original topsoil has made it difficult again to get a good stand of pasture grass. This situation has greatly decreased the quality of pasture in the area, especially in the western half. Recurrent droughts in the years since 1929 have also been unfavorable to pasture reseeding and growth, adding to the decline in quality.

Crops. Corn and hay are the principal crops grown, corn acreage in 1929 occupying 23% of the land in crops, and hay 58%. In the best pasture sections in the eastern part, hay acreage is relatively greater than in the western section, where pasture is less productive. The

greatest corn acreage in the area occurred around the year 1900, but since that time it has decreased and hay acreage increased in all sections. Corn occupies a greater percentage of crop acreage in the poorer pasture and hay sections of the area.

Oats has always been a minor crop, occupying only 7% of the crop land in 1929. About 70% of the oats crop was cut and fed unthreshed. The highest yields were found in the higher elevations of the eastern section.

Wheat acreage had practically disappeared in 1929, Jackson and Barbour Counties being the only counties with over 1000 acres each. The area as a whole had only about 5000 acres. In 1899, however, there were nearly 110,000 acres of wheat in the area, and it was an important cash crop in all sections.

Although orchards occupied 8% of all land in crops in 1929, commercial fruit production was found on only a few scattered farms. The farm orchards were generally neglected and produced inferior fruit. Potato acreage was mainly for farm consumption with some surpluses for sale, especially in the areas of higher altitudes. In Barbour, Taylor, and Upshur Counties buckwheat acreage was of some importance on a limited number of farms, in the higher altitudes. Some truck farming was done around the towns in the area, but on a small scale.

Livestock. Cattle, sheep, and poultry are the important livestock in the area. Cattle and sheep are fed mainly on the natural pasture grasses found in all sections. In 1930, 30% of all cows and heifers were kept primarily for beef purposes and 70% for dairy purposes.

A large number of the breeding herds are kept for beef production. In Lewis County, where pasture has a relatively higher carrying capacity and where the market for dairy products is somewhat limited, 37% of all cows and heifers were kept for beef purposes in 1930. The highest percentage of steers over 2 years old was in sections with the best natural pastures. In Harrison and Lewis Counties 51% of all beef steers in 1930 were 2 years old or over, while in the less fertile sections there was a higher proportion of yearlings. Many of the yearlings and calves produced in other areas in the state from dairy or dual-purpose breeding stock move into Area 8 for growth and fattening on pasture.

Sheep are an important livestock enterprise on many farms in the area, although not as high a proportion of the farms have sheep here as in Area 3. Compared to Area 3, much of the pasture land in Area 8 is less rough, with considerably less woods pasture. Beef cattle are better adapted to this smoother pasture area. The greatest numbers of sheep per farm and the greatest percentage of farms which had sheep in the area was in Lewis County.

The numbers of chickens in the area have increased steadily since 1880. Jackson and Roane Counties had the greatest number of chickens per farm. In Jackson County the poultry enterprise was of major importance on many farms. Hogs are not commercially important in any section but are grown by a majority of farms for home butchering.

Sources of Income and Types of Farms. In 1929 the sale of livestock was 56% of all cash sales of farm products in the area; livestock products, 31%; crops, 9%; and forest products, 4%. The proportion of the income from livestock was greatest in those sections of the area further removed from centers of population. About two-thirds of all cash income was from livestock sales in Lewis, Doddridge, Gilmer, and Roane Counties. Crop sales were of only minor importance in all sections. In the western section of the area, especially in Jackson County, the poultry enterprise was of considerable importance, as well as in Braxton County in the south. Generally speaking, the bulk of the dairy income in the area was on specialized dairy farms selling whole milk for city consumption.

Specialized Livestock Farms. Although only 14% of all farms were of this type, the income to them was 34% of all the cash farm income in the area, and they represent the most commercialized type of livestock-producing farms. On this type of farm crop sales were negligible and the sale of livestock products seldom amounted to over 15% of all cash income, with receipts from the sale of livestock amounting to from 80 to 95%. The average size of farm ranged from 180 to 550 acres, with a high percentage of farm land in grass and a high percentage of crop land in hay. The greatest numbers of this type of farm were found in the most concentrated pasture sections in Lewis, Harrison, Ritchie, and Roane Counties, but they were also distributed over the entire area. Average cash income on this type of farm ranged from $1,800 to over $7,000 per farm, the largest incomes being on farms where steers were fattened on pasture and sold for slaughter.

General Farms. General farms include the farms with relatively smaller acreage of pasture land where more intensive use was made of the land and labor available. This type was 20% of all farms in the area and their cash income was 20.5% of the total. Their average size was around 130 acres. Livestock sales provided 35% of their income; livestock products sales, 50%; and crop sales, 15%. In the western part of the area poultry products were a large part of the livestock products sales, but in other sections dairy products and wool were more important. The value of the farm products used by the operator's family was about one-third of the total gross income per farm.

Self-Sufficient and Part-Time Farms. Although farms of this type were 38% of the total number of farms, their cash income was only 21% of total cash income to the area. The greatest numbers of this type were found in the less favorable agricultural sections of the area where the opportunities for commercial agriculture were limited. Their average size ranged from 60 to 100 acres for the various counties in the area, and their sources of income were quite similar to those of the general farms, the chief difference being in the volume of sales. The value of the farm products used by the operator's family was about two-thirds of the gross income per farm. The cash income per farm was approximately $200 in 1929.

Following are two illustrations of livestock farms in the area. The first is a record of a larger-than-average livestock farm in Lewis County and the second a small livestock farm in Ritchie County.

ORGANIZATION OF ONE LIVESTOCK FARM IN LEWIS COUNTY (AREA 8), 1934 (FARM "J")

Acres in Farm	457	*Investment in Farm*	$11,383
Crops	34	Land	7,000
Open pasture	367	Buildings	2,000
Woods not pastured	50	Machinery and equipment	485
Farmstead, waste	6	Livestock	1,898

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	6	210 bu.	210 bu.	.....
Hay, mixed	25	25 T.	25 T.	.....
Soybean hay	1	1 T.	1 T.	.....
Potatoes	1	100 bu.	50 bu.	50 bu.
Garden, orchard	1	.....	All	.....
Livestock Numbers				
Beef cows	20	1500 gal. milk 16 calves	700 gal. milk	300 lb. butter
Beef steers & heifers	26	.....	.....	16 steers
Bull	1	.....	.....	.....
Calves	17	.....	.....	.....
Horses	2	.....	.....	.....
Sows	1	8 pigs	3 hogs	5 pigs
Ewes	75	375 lb. wool 100 lambs	.....	375 lb. wool 100 lambs
Chickens	35	56 chickens 150 doz. eggs	36 chickens 100 doz. eggs	20 chickens 50 doz. eggs

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 90	Potatoes 50 bu. @ $1	$ 50
Fertilizer 1.7 T.	65	Beef 14,400 lb. @ 5c	720
Feeds 2.2 T.	60	Lambs 8,500 lb. @ 5.5c	468
Bldg., fence repairs	35	Wool 375 lb. @ 28c	105
Miscellaneous	66	Pigs 5 @ $3	15
		Chickens 20 @ 50c	10
	$316	Eggs 50 doz. @ 16c	8
		Butter 300 lb. @ 20c	60
			$1,436

Cash receipts less expenses = $1,120.
Operator's work off farm (on road), $105. Oil and mineral royalties, $75.
Farm products used by family of 7: 5 bu. corn for meal, 30 bu. potatoes, 500 lb. pork (dressed), 700 gal. milk, 100 doz. eggs, 36 chickens, vegetables from large garden, and apples.

Farm "J" is illustrative of a type having a breeding herd of cows and raising and fattening all the livestock sold. The land is rolling to rough, with an average slope too great for tillage except for about 30 acres adjacent to a stream. In 1934, 80% of the farm was in open pasture, with only a small acreage in crops. With pasture as the principal feed supply for livestock, the crop acreage must be devoted mainly to growing winter feeds. Therefore, a high percentage of the

crop land was in hay. The natural pasture is good in this section, and it has the ability to fatten steers without grain feeding. Crop yields were about average on this farm. The quality of the beef cattle was better than average, with the Shorthorn breed predominating. Some cows were milked during the pasture season. Hampshire ewes were kept, and the lambs were dropped in lambing pens and cared for until able to graze with the ewes. No grains were fed to lambs, and the ewes were roughed through the winter on hay and corn stover.

Steer and heifer beef was sold as long 2- or 3-year-olds averaging 900 pounds per head. Lambs were sold in October at an average weight of 85 pounds.

With such a high percentage of the receipts of this farm coming from livestock, changes in livestock prices affect the income greatly. An increase in livestock prices above the relatively low levels in 1934 would cause a direct increase in income to the farm. Most of the larger farms in this area raising livestock are similar to this in their organization and sources of income.

ORGANIZATION OF ONE LIVESTOCK FARM IN RITCHIE COUNTY (AREA 8), 1934 (FARM "K")

Acres in Farm	175	*Investment in Farm*	$5,300
Crops	25	Land	2,500
Open pasture	120	Buildings	1,500
Woods not pastured	20	Machinery and equipment	260
Farmstead, waste	10	Livestock	1,040

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	5	200 bu.	200 bu.	.....
Wheat	4	56 bu.	56 bu.	.....
Hay	15	15 T.	15 T.	.....
Garden, orchard	1	.....	All	.....
Livestock Numbers				
Beef cows	8	1000 gal. milk	1000 gal. milk	.....
		7 calves	.....	.....
Steers & heifers	15	.....	.....	7 steers
Calves	8	.....	.....	.....
Horses	1	.....	.....	.....
Hogs	2	.....	2 hogs	.....
Ewes	22	160 lb. wool	.....	160 lb. wool
		31 lambs	.....	31 lambs
Chickens	50	110 chickens	50 chickens	60 chickens
		325 doz. eggs	75 doz. eggs	250 doz. eggs

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 50	Beef 5600 lb. @ 5c	$280
Fertilizer 1200 lb.	16	Lambs 2800 lb. @ 6c	168
Feeds, salt	12	Wool 160 lb. @ 29c	46
Labor (day)	15	Chickens 60 @ 50c	30
Miscellaneous	62	Eggs 250 doz. @ 17c	42
	$155		$566

Cash receipts less cash expenses = $411.

Farm products used by family of 5: 12 bu. corn for meal, etc., 5 bu. wheat for flour, 400 lb. dressed pork, 50 chickens, 75 doz. eggs, 500 gal. milk, 200 lb. butter, 15 bu. potatoes and other vegetables from garden, and apples of poor quality from 15 trees.

Farm "K" is a well-operated farm, having limited hilly pasture of average quality, with only 15 acres of rolling bottom land. All crop production operations are performed by hand except corn cultivation by one-horse cultivator and hay cutting with mower. The wheat was cut with a cradle. Usually in this section wheat is not grown but this farmer substituted wheat for oats, the usual crop. No wheat was sold, but it was fed to chickens.

Livestock was of good quality, the Shorthorn breed predominating. The Hampshire ewes were well cared for, especially during lambing time. Some grain was fed to lambs, which were sold at weights above average. Steers were fed on grass and sold either at two or three years of age. The fertilizer purchased was applied to the wheat, and the manure applied to corn ground.

The small amount of pasture, which is the principal source of feed on this farm, limits the amount of livestock which can be carried, and, therefore, limits the livestock income. Gas royalties were at one time $300 per year but had decreased to $120 in 1934.

AREA 9—DAIRYING, SELF-SUFFICING, GENERAL

The elevation of Area 9 varies from about 650 feet near the Ohio River to above 1000 feet in the eastern part of Wetzel County. Land having an average slope of less than 12% is 14% of the land in the area, and 69% has a slope of over 25%. In general, the land becomes rougher going up the Ohio River. Very little level bottom land is located on the West Virginia side of this river within the area. The greatest expanse of relatively level land is along the Little Kanawha and Ohio Rivers in Wood County, with the greatest amount of land with a slope between 12 and 25% in Wood and Pleasants Counties.

The narrow strips of bottom land along the Ohio River are Class 1 land (best crop land) and are situated mainly in Wood County. Above-average or average crop land (Classes 2 and 3) is found along the Little Kanawha River in Wood County, and in the valley of Middle Island Creek, mainly in Tyler County. Aside from these sections, poor crop land (Class 5) predominates with outcroppings of submarginal crop land (Class 6).

Land Use. In 1929, 71% of the land surface was in farms, the greatest percentage being in Tyler County. Land in crops was 25% of all farm land; pasture, 56%; and woodland not pastured, 15%. As in Area 8, the average slope of the land limits crop production, and the utilization of pasture by livestock is of major importance. Very little of the pasture is in woods.

Crops. With pasture one of the major sources of feed, hay for winter feeding of the livestock on farms occupied 53% of the crop land in 1929. Corn occupied 24% of the crop land; oats, 8%; and farm orchards, 8%. In the last 30 years, corn acreage has tended to decrease in this area, with a corresponding increase in hay acreage. Oats has always been a minor crop, with about 60% of the acreage

being cut and fed unthreshed. In 1900 wheat was an important cash crop on many farms, especially in Wood and Wetzel Counties, but by 1929 its acreage was negligible.

Potato and truck-crop production is mainly for home consumption, but there are a few commercial producers of these crops along the Ohio River. The acreage in orchards is also mainly for farm consumption, with only a few scattered commercial orchards in the area.

Livestock. Since the peak in cattle numbers in the area around 1910, a moderate decrease in total numbers has taken place. Cattle kept for beef purposes have decreased considerably, being replaced by dairy cows. Of all farms in the area, 87% reported that cows were milked during 1929. Two-thirds of these cattle were of dairy breeding and one-third of beef or dual-purpose breed.

The numbers of sheep in the area have decreased greatly since 1900, and in most sections are of minor importance as a source of income. Since the growth of population centers in nearby areas, and the improvement in roads, cows kept for dairy purposes have replaced both sheep and beef cattle to a great extent as users of the available pastures. In the northern sections, some farms still are found with relatively large numbers of sheep, mostly fine-wool breeds, as in former years. These farms are usually situated in sections not easily reached by good all-weather highways.

The numbers of chickens increased steadily in the area, especially in Wood County near the City of Parkersburg. While few commercial poultry farms are found, the sales of eggs and poultry from farm flocks is an important source of income on a majority of farms.

Hog numbers have decreased greatly since 1890, when they were of commercial importance in the area. At present they are grown mainly for farm family consumption, with feeder pigs being produced by a relatively few farmers and sold to neighbors for fattening.

Sources of Income and Types of Farms. One-half of the cash income to farms in 1929 was from sales of livestock products, 31% from sales of livestock, and 16% from sales of crops. Dairy products sales gave about one-half the income from livestock products, with eggs, chickens, and wool sales the remainder.

The income from crops was the greatest in Pleasants and Wood Counties, which have a higher percentage of bottom lands and are closer to market. In Tyler and Wetzel Counties, the income from livestock and wool sales was relatively higher than in the southern half of the area, but in all sections, dairy products made up at least 25%, and chickens and eggs 20% of all cash income.

General Farms. General farms were 26% of all farms and received 30% of the cash income. The average gross income was about $1100 per farm, of which about one-third was the value of farm products used by the operator's family. Slightly more than one-half of the cash income was from the sale of livestock products, with about one-fourth from the sale of livestock, and about 15% from crop sales.

The crop sales were mainly potatoes, other vegetables, and small amounts of fruits.

The livestock products sales were dairy and poultry products. A large percentage of the dairy products sold from these farms was either cream or butter. In 1929, 93% of all general farms reported milk cows.

Self-Sufficient and Part-Time Farms. Although these types of farms were 54% of all farms, their cash income was only 35% of all cash income of the area but they occupied 39% of the land in farms. The cash income per farm was about $200, of which the sale of livestock products contributed about 61%; crops, 15%, and livestock, 20%. The value of farm products used by the operator's family made up about two-thirds of the gross income per farm. Most of these farms reported keeping milk cows, and their organization was similar to the general farms except on a smaller pattern.

Dairy Farms. Cash income to dairy farms represented 16% of the total income of the area although only 8% of all farms were dairy farms. The greatest numbers of dairy farms were found in Wood County with the least numbers in Wetzel. Two types of dairy farms were included in this classification. In Wood County the dairy farms to a considerable extent were commercial producers of whole milk for consumption in the city. In 1929, 35% of all milk produced in the county was sold in this form. The average income per dairy farm in Wood County was nearly double that of dairy farms in the other counties of the area. Dairy farms in this county included many of the smaller farms selling cream and butter. The average herd was nine milk cows per farm but in the other counties it was between five and six. In contrast only about 7% of all milk produced in Pleasants, Tyler, and Wetzel Counties was sold as whole milk, the remainder of that sold going on the market as cream or butter. For the area as a whole dairy farms produced only 25% of the milk, the balance being on farms where dairying was only one of several enterprises.

Most of Farm "L" is located on a ridge of comparatively poor soil with only 10 acres of fairly level bottom land. Part of the crop land is quite rolling, and the pasture land is steep and rough. The grasses were not of heavy growth, but one-half of the land on a southern slope gave a good quality grass which would fatten beef cattle. Corn, oats, wheat, and hay were grown in a semblance of a rotation. The buckwheat was grown on two fields along the edge of the woods. This soil was comparatively good because it had been cleared only three years previously, but the slope was steep. The soybean hay grew well and gave a yield of two tons per acre.

The dairy cows were of mixed beef and dairy breeds and the beef cows were Herefords. The calves were grass fattened and sold for beef usually as long 3-year-olds. With the exception of the buckwheat, all grains were fed to the livestock. The pigs produced were sold to neighbors, three being retained for fattening and butchering for farm consumption. The milk was sold as cream and the skim milk fed to chickens.

The following record of a farm in Pleasants County will illustrate the general farms in the area.

ORGANIZATION OF ONE GENERAL FARM IN PLEASANTS COUNTY (AREA 9), 1934 (FARM "L")

Acres in Farm	325	*Investment in Farm*	$8,366
Crops	64	Land	4,000
Open pasture	208	Buildings	2,400
Woods pasture	50	Machinery and equipment	715
Farmstead, waste	3	Livestock	1,251

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	15	350 bu.	350 bu.	.....
Oats	6	155 bu.	155 bu.	.....
Wheat	6	120 bu.	120 bu.	.....
Buckwheat	5	165 bu.	125 bu.	40 bu.
Hay, mixed	25	25 T.	25 T.	.....
Soybean hay	6	12 T.	12 T.	.....
Potatoes	1	125 bu.	35 bu.	90 bu.
Garden, fruits	1	.....	.....	$15

Livestock Numbers				
Dairy cows	7	7 calves	220 lb. butter	82 cans cream
Beef cows	4	4 calves	.....	.....
Yearling steers	7	.....	.....	.....
2 and 3 yr. old steers	9	.....	.....	7 steers
Bull	1	.....	.....	.....
Horses	3	.....	.....	.....
Sow	1	12 pigs	3 pigs	9 pigs
Hens	200	2000 doz. eggs 200 chickens	200 doz. eggs 50 chickens	1800 doz. eggs 150 chickens

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 61	Buckwheat, 40 bu. @ $1	$ 40
Feeds, poultry, 1 T.	32	Potatoes 90 bu. @ 90c	81
Fertilizer 1½ T.	30	Vegetables from garden	15
Day labor	15	Beef 5,600 lb. @ 5c	280
Monthly labor, 12 mos.	336	Cream 82 cans @ $4	328
Miscellaneous	115	Eggs 1,800 doz. @ 22c	396
		Chickens 150 @ 50c	75
Total	$589	Pigs 9 @ $3	27
		Total	$1,242
		Gas-well royalties	150
		Grand Total	$1,392

Cash receipts less cash expenses = $803.

Farm products used by family of 4: 150 gal. milk, 220 lb. butter, 50 chickens, 600 lb. dressed pork, 200 doz. eggs, wheat flour, buckwheat flour, 35 bu. potatoes and vegetables.

Only one ton of feed was bought, mainly for chickens. The eggs, chickens, and cream were sold in the nearest town 15 miles away. A large variety of products was furnished by the farm for family living, and gas wells on the farm gave an income of $150 in 1934.

Steers were sold at an average weight of 800 pounds, the pasture not being of good enough quality to feed them out to a fat finish.

AREA 10—DAIRYING, SELF-SUFFICING, PART-TIME

The area lies at an elevation of between 1000 to 1500 feet except in the lower lands along the Monongahela River and its tributaries. Only 9% of the land has an average slope of less than 12%, and 63% has a slope of between 25 and 40%. In general, the land gets smoother as the Monongahela River is approached. The roughest land lies towards the Cheat River along the eastern border of the area, but there is also much rough land along the western border. No large areas of level land are found in this area.

Some average to below-average crop land and good pasture land (Classes 3 and 4) is found in various small sections near the Monongahela River. Most of the other land is average pasture or poor crop land (Class 5) with a strip of forest land in the rough section towards the Cheat River.

The land in farms was 62% of the land surface of the area in 1929. Crops were grown on 23% of the farm land, pasture on 60%, and woods not pastured on 15%. More than 80% of the pasture land was open pasture, the remainder in woods.

Crops. Hay and corn were the principal crops grown. In 1929 hay occupied 55% of the crop land; corn, 21%; oats, 11%; and orchard, 9%. As in Areas 8 and 9, the acreage of corn has tended to decrease in the last 30 years, with a corresponding increase in hay acreage. The increase in dairying has resulted in an increased demand for hay which farmers have attempted to meet.

Oats has never occupied a high percent of the crop land in the area, and in recent years the acreage has decreased greatly. About two-thirds of the oats acreage was cut and fed unthreshed in 1929.

Wheat in 1899 was an important grain crop in the area, with over 19,000 acres. Since 1899, however, the acreage has gradually decreased until in 1929 there was a very small acreage.

Livestock. The greatest numbers of beef cattle were in the area around 1890, but by 1920 the numbers had decreased greatly. With the steady growth in demand for whole milk for the various cities in the area, the numbers of dairy cows have steadily increased, replacing the beef cattle to a great extent as the users of pasture and feed crops. Sheep numbers in the valley have also decreased greatly for the same reason. In recent years, however, sheep numbers have increased in the sections more removed from the immediate valley lands. Hogs have always been of minor importance and are mainly raised and fattened for farm family consumption. The numbers of chickens have steadily increased in response to the increase in demand from the growing cities in the area.

Sources of Income and Types of Farms. In 1929, 59% of all the cash farm income in the area came from the sale of livestock products, 27% from livestock, 10% from crops, and 4% from forest products. Of the total value of livestock products 60% was from dairy products and 36% from eggs and chickens. The value of the farm products used by the operator's family was 38% of the gross farm income.

Dairy Farms. Farms classified as dairy farms were 7% of all farms. These farms were specialized units producing whole milk for city consumption. About 90% of all cash receipts of these farms was from the sale of livestock products, mostly whole milk. Very little milk was sold as whole milk from farms other than dairy farms. The average size of these dairy farms in 1929 was about 130 acres, with approximately 20% of the farm land in crops. The average number of cows milked was 12 per farm. The limited amount of crop land available made it necessary for a majority of these farms to buy a large percentage of their concentrate feeds. In 1929, 29% of all milk produced in the area was sold as whole milk, 18% in the form of butter, and a small percentage as cream. About one-half of the milk produced was consumed on farms.

General Farms. In 1929, 17% of all farms in the area were classified as general farms. Receipts from crops on these farms made up 20% of all cash receipts; livestock 25%; and livestock products, about 50%. The livestock products were mainly poultry and eggs, butter, and cream. The crops sold were potatoes, vegetables, fruits, and berries. The value of the farm products used by the operator's family was one-third of the gross farm receipts.

Self-Sufficient and Part-Time Farms. Self-sufficient farms were 39% of all farms in the area and had an average cash income of about $200 per farm. Income from the sale of butter, eggs, and poultry was about 60% of all cash income; sales of crops, 15%; and livestock, 25%. These farms were similar to the general farms except that they were smaller in size. Consistent with nearness to various cities, part-time farms were 22% of all farms, their operation and volume of business being similar to the self-sufficient farms.

Poultry Farms. Poultry farms in the area were only 3% of the total in 1929 and received 4% of the cash income. They had a relatively small acreage per farm but produced about 20% of the total poultry and eggs of all farms in the area. In 1929, about two-thirds of all the eggs produced in the area were sold from the farm.

Scattered through the area were small numbers of specialized livestock, fruit, truck, and crop farms, but the total of these was only a small percentage of all farms.

AREA 11—GENERAL, DAIRYING, LIVESTOCK, POTATOES

Farms in Preston County in general have a more favorable topography for crop production than in any area in the state except Area 1. With no outstanding cash crop except potatoes being adapted by nature to the climate and soil types, and with no large market existing for whole milk, a diversified system of farming prevails in the area.

The eastern part is on the Alleghany Plateau with an elevation of between 2500 and 3000 feet, with a general elevation between 1500 and 2000 feet in the western half of the area. Land with a slope of less than 12% is 21% of the land area, and that with a slope between 12 and 25% is 56% of all land. Only 2% of the land has a slope of over 40%. The smoothest areas are located on the high plateau section in the

eastern part and in Sandy Creek and Beaver Creek glade land in the northeastern part of the county. The roughest land lies along the Cheat River running northwest through the county.

Average crop land or good pasture land (Class 3) with some contiguous below-average crop land or above-average pasture (Class 4) is found in the northeastern part of the county, and some Class 3 land in the central west part around Reedsville and extending west to the area boundary. Below-average crop land or above-average pasture land (Class 4) is found along the eastern edge on the Alleghany Plateau. Much of the land contiguous to the Cheat River is forest land. Aside from the land indicated, the bulk of the remainder is average pasture or poor crop land (Class 5).

Land in farms was 60% of the total land in the area in 1929, of which 26% was in crops, 48% in pasture, and 21% in woods not pastured. The 48% pasture land was made up of 34% open and 14% woods. The percentage of farm land in crops was greatest in the northern section of the area and least in the west central.

Crops. Where rotations were practiced, corn, small grains, and hay were usually planted in sequence. Hay occupied 45% of the crop land in 1929; corn and oats, 16% each; and buckwheat, 13%. Hay usually occupies the same land two or more years, and buckwheat may be grown either after corn or perhaps on poor crop land not in the rotation. Buckwheat is also used as a catch crop for early summer planting after failure of other crops requiring a longer growing season.

The acreages of various crops in this area are relatively stable from year to year, a marked characteristic of this area. Wheat acreage, while only 4% of the crop land in 1929, is found on certain farms each year. The hay is mainly timothy and clover mixed, very little alfalfa being grown. The oats crop is nearly all threshed for grain. About one-third of all buckwheat acreage of the state is found in this area, where the crop is used as livestock feed, in the home, or sold as a cash crop.

Although potato acreage made up only 2.1% of the crop land of the area in 1929, potatoes were grown on 90% of all farms, and in nearly all sections potato sales were at least a minor source of income. On the Alleghany Plateau section in particular, potatoes were grown as a commercial crop on many farms, the soil and climate in the local sections being well adapted to the crop. Under the generally favorable producing conditions, the yields per acre are high, especially on farms where enough acreage is grown to use special spraying, tillage, and harvesting implements.

Livestock. Within the past 20 years, cattle which were kept primarily for beef purposes have been replaced to a great extent by cattle kept for dairy purposes. Sheep have tended to be replaced to a considerable extent by dairy cattle as users of the available pasture and feeds. This replacement has been the greatest in sections reached by good roads and nearest to market outlets for dairy products. About one-third of the farms reported keeping sheep in 1929, the greatest numbers being found in the northeastern and plateau sections of the area.

Hogs are kept mainly for farm slaughter and consumption, with only small numbers grown commercially in the northeastern section, where corn acreage is the greatest.

The numbers of chickens have increased steadily in the area and although few commercial producers are found, surplus eggs from farm flocks are an important source of income on a majority of farms. About three-fourths of all the eggs produced in 1929 were sold.

Sources of Income and Types of Farms. Income from the sale of crops was 26% of all cash income in 1929; livestock, 29%; livestock products, 38%; and forest products, 7%. The value of the farm products used by the operator's family was 34% of the gross receipts. Dairy products and poultry and eggs each made up about 18% of the total cash income.

General Farms. General farms were 40% of all farms in the area and received 46% of the total cash income. The general type of farm had about 37 acres in crops but only 45 acres in open pasture. Corn, oats, buckwheat, hay, and potatoes were the crops grown. Surplus potatoes and buckwheat were the principal crops sold, with cream, butter, eggs and poultry, and small amounts of wool making up the bulk of the livestock product sales. A few lambs, cull ewes and cows, perhaps a beef steer, or a few hogs were the livestock sold. In 1929 the average gross income per farm was $1,325, of which $943 was cash, the remainder being the value of products used in the home.

Specialized Livestock Farms. Specialized livestock farms were only 5% of all farms in the area, but they received 11% of the total cash income. Their average size was about 230 acres, with 48 acres of crops and 103 acres of open pasture. These livestock farms were similar to the general farms except for the much greater amount of open pasture, which permitted a relatively higher percentage of the receipts to be from livestock sales. The value of crops sold from each type was nearly the same, with the general farms having a little greater volume of receipts from the sale of livestock products.

Self-Sufficient Farms and Part-Time. Self-sufficient farms comprised 35% of the farms in the area. They were also similar to the general farms in sources of receipts, but they had a smaller acreage and did a much smaller volume of business. The value of farm products used by the operator's family was 65% of all receipts. Part-time farms made up 11% of the total in the area.

Dairy Farms. Dairy farms were mainly those selling whole milk in local cities and towns. They comprised 2.7% of the farms but sold 85% of the whole milk which was sold in the area. They had an average of 10 cows milked per farm, 39 crop acres, and 60 acres of open pasture. In 1929, three-fourths of the cash income to dairy farms was from the sale of whole milk; from livestock, 17%; and from crops, 7%. Only 9% of all milk produced in the area was sold as whole milk, 27% being sold in the form of butter and cream. Dairy farms produced only 13% of all milk produced in the area.

Small numbers of cash grain farms, specialized potato farms, and poultry farms were scattered through the area. The potato farms were found in greatest numbers in the high plateau section of the area. A large part of the surplus potatoes are produced on farms where potatoes are only one of several enterprises carried on.

The following records of two farms in Preston County will serve further to illustrate the type of farming in the area.

ORGANIZATION OF ONE GENERAL FARM IN PRESTON COUNTY (AREA 11), 1934 (FARM "M")

Acres in Farm	212	*Investment in Farm*	$10,573
Crops	57	Land	4,000
Open pasture	80	Buildings	4,000
Woods pasture	10	Machinery and equipment	1,425
Woods not pastured	63	Livestock	1,148
Farmstead, etc.	2		

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	12	480 bu.	480 bu.	.....
Wheat	4	112 bu.	112 bu.	.....
Oats	10	250 bu.	250 bu.	.....
Buckwheat	7	210 bu.	85 bu.	125 bu.
Potatoes	3	700 bu.	50 bu.	650 bu.
Hay	20	30 T.	30 T.	.....
Garden, fruits	1	.....	All	.....

Livestock Numbers				
Cows	8	2700 gal. milk 8 calves	900 gal. milk	1800 gal. milk .....
Heifers	6	.....	.....	.....
Steers	10	.....	.....	8 steers
Horses	2	.....	.....	.....
Sows	2	15 pigs	4 hogs	11 hogs
Ewes	8	8 lambs	.....	8 lambs
Chickens	200	260 chickens 1700 doz. eggs	60 chickens 100 doz. eggs	200 chickens 1600 doz. eggs

Cash Expenses	
Taxes and insurance	$ 97
Feeds, poultry, 2½ T.	75
Fertilizer 5 T.	125
Monthly labor, 12 mos.	300
Bldg. fence, machine repairs	85
Other cash	220
Total	$902

Cash Receipts	
Potatoes 650 bu. @ 90c	$585
Buckwheat 125 bu. @ 75c	94
Beef steers 6400 lb. @ 5c	320
Hogs 2200 lb. @ 6c	132
Lambs 680 lb. @ 6c	41
Wool 48 lb. @ 26c	12
Cream 223 gal. @ 90c	201
Eggs 1600 doz. @ 18c	288
Chickens 200 @ 80c	160
Lumber, mine ties and props	240
Total	$2,073
Gas-well royalty	106
Grand Total	$2,179

Cash receipts less cash expenses = $1,277.

Farm products used by family of 4: 550 gal. milk, 125 lb. butter, 50 bu. potatoes, wheat and buckwheat flour, 600 lb. dressed pork, 60 chickens, 100 doz. eggs, vegetable garden, apples and pears.

Most of the land on Farm "M" is rolling, with about 10 acres of level bottom along a stream. The elevation is about 2000 ft. On the average, the soils on this farm are not the best, but they respond to treatment. The high altitude is favorable to potatoes, but corn must be planted early to mature before frosts. Corn, small grains, and hay make up the rotation usually followed with the potatoes being confined to the more favorable potato soils, and buckwheat being grown on the least fertile land. The grain yields obtained in this year were above-average for the area but about usual for this farm. Complete fertilizer was applied to oats, corn, and buckwheat acreage, with 1700 pounds per acre applied to the potato acreage. All the necessary potato-growing equipment was used including a sprayer and digger. Plowing was done by tractor except on one field on top of a knoll where horses were used. Dual-purpose cows were kept, mainly Shorthorn-Holstein crossbreds. The steers were roughed through the winter months on corn stover, wheat straw, and hay, then fattened on grass. The wheat was fed to poultry and the buckwheat to poultry and hogs. In this year 2½ tons of additional poultry feed was purchased. Eggs, poultry, cream, buckwheat, and potatoes were hauled 24 miles to market. Outcroppings of limestone rock on the farm gave stone which was burned in the fields with coal from a narrow vein also on the farm. One gas well gave an income of $106 this year, and $240 worth of mine-ties and props was cut from the woods as an additional income.

Farm "N" is representative, in general, of the type of farm producing potatoes commercially in the mountain counties. The relatively high altitude, cool summers, and well-adapted soil give relatively good yields of potatoes. The topography in this area is rolling to rough. The soil types suited to potato growing are limited in extent.

On the farm under consideration the land is somewhat less rough than average, and more land suitable for crops was available. Corn acreage is limited because of the short growing seasons, and oats, wheat, and buckwheat replace corn to some extent as feed crops. Much of the corn grown in these areas is put into silos in localities where dairy or beef cattle are of importance. The limestone deficiency in the high altitudes is not as great as in other sections, and alfalfa hay will make a satisfactory stand with less lime and fertilizer applications. On this farm the growing season was relatively favorable for all crops and the yields of grains and hay indicated are slightly above-average, but the potato yield is not unusual for commercial acreage.

The manure available on the farm was applied to the potato and buckwheat acreage, with an addition of 1000 pounds of 3-8-10 fertilizer on the potato acreage. Many potato growers plow under a green manure crop such as soybeans or vetch on their potato acreage in addition to the manure and fertilizer applied. Commercial fertilizer was applied to all grain crops.

Good pasture was limited on this farm, and dairying was more advantageous than beef cattle or sheep. Low-quality cows were kept, and the production per cow and income to the dairy enterprise could be greatly increased by keeping better-quality cows. The operator's

ORGANIZATION OF ONE POTATO-DAIRY FARM IN PRESTON COUNTY (AREA 11), 1934 (FARM "N")

Acres in Farm	265	*Investment in Farm*	$10,077
Crops	62	Land	5,200
Open pasture	80	Buildings	3,000
Woods not pastured	121	Machinery and equipment	1,100
Farmstead	2	Livestock	777

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn	10	500 bu.	500 bu.	.....
Oats	12	400 bu.	400 bu.	.....
Wheat	3	63 bu.	63 bu.	.....
Buckwheat	6	260 bu.	260 bu.	.....
Alfalfa hay	4	9 T.	9 T.	.....
Mixed hay	20	30 T.	30 T.	.....
Potatoes	6	1500 bu.	200 bu.	1300 bu.
Garden, orchard	1	.....	All	.....

Livestock Numbers				
Dairy cows	12	3100 gal. milk	.....	350 gal. cream
Heifers	6	.....	.....	3 heifers
Bull	1	.....	.....	.....
Calves	4	.....	.....	.....
Mules	2	.....	.....	.....
Sow	1	12 pigs	3 hogs	9 pigs
Chickens	100	750 doz. eggs 25 chickens	250 doz. eggs 25 chickens	500 doz. eggs .....

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 68	Potatoes 1300 bu. @ 94c	$1,222
Feeds 3.8 T.	100	Heifers, dairy, 3 @ $18	54
Fertilizer 5 T.	125	Cream 350 gal. @ 85c	297
Labor, day	60	Pigs 9 @ $3	27
Potato seed, sprays, bags, etc.	243	Eggs 500 doz. @ 16c	80
Other cash	227		
Total	$823	Total	$1,680

Cash receipts less cash expenses = $857.

Farm products used by family of 7: wheat for flour, buckwheat for flour, 550 lb. dressed pork, 25 chickens, 250 doz. eggs, 150 lb. butter, 900 gal. milk, potatoes for the year, vegetables from garden, apples and grapes, small fruits, and honey from 4 hives of bees.

interest was in the potato business, however, and all improved machinery such as a sprayer, weeder, and digger were found on the farm.

A relatively good price prevailed for potatoes during the year of the record, but with an unfavorable price, the income of this farm would decrease directly because receipts from potatoes made up nearly three-fourths of the total income. An increase in the productivity of the dairy enterprise would be some insurance against a low income for the farm caused by low potato prices in any one year.

AREA 12—DAIRYING, GENERAL, SHEEP (FINE WOOL)

This area is characterized by long, sloping hillsides leading down to narrow gullies between the hills, with almost no bottom land along the small streams. The pasture and crop land is located either on the

side hills or on top of the hills. The gullies at the bottoms of the hillsides remain in woods. The elevation lies on the average between 1000 and 1500 feet with less than 1000 feet along the larger streams and rivers. The area as a whole is rolling to rough in topography, with only 8% of the land having a slope of less than 12% and 64% having a slope of more than 25%. Best crop land (Class 1) is found in a small strip along the Ohio River in the southwestern part of this area, but along this river in other sections the land is rougher than that farther away from the river. In Hancock, Brooke, and Ohio Counties, above-average crop land (Class 2) prevails with strips of Class 3 land occurring in each county and extending into Marshall County, where it is the predominating class. On the average, the prevailing soil types are quite productive where erosion has not removed the bulk of the topsoil, and the permanent pastures, with reasonable care, have good carrying capacity.

Land Use. The land in farms was 72% of the total land area in 1929. Open pasture was 41% of the land in farms; crop land, 34%; and woodland, 17%. The long, sloping hillside pastures are suitable for both cattle and sheep, and most of the land in farms is not too rough for cattle pasturing.

Crops. The small percentage of the land area in comparatively level land limits crop acreage, especially tilled crops. The difficulty of growing tilled crops on the steep slopes without serious soil erosion has made hay the principal crop grown from the standpoint of acreage. In 1929, hay occupied 51% of the crop land; corn, 21%; oats, 12%; and wheat, 4%. In the three northern counties both corn and hay acreage have decreased as the land in farms has decreased as a result of the expansion of population along the Ohio River. As in Area 8, wheat acreage has decreased greatly since 1899 until it is not grown on most farms. In Marshall County, where the effects of increasing city populations have been less marked, hay acreage has remained nearly constant since 1899, with some decline in corn acreage. Soil types over most of the area are conducive of alfalfa production, and the acreage in this area is greater than in most sections of the state. Oats has always been a minor crop, and the acreage has declined greatly. Most of the oats is threshed for grain. Except in Hancock County, the acreage devoted to orchards was confined mainly to the farm orchard. In Hancock County, where the orchard acreage is relatively three times as great as in other counties, several commercial fruit farms were found in 1929. In most sections of the entire area, except in the southern part, fruit growing, especially apples, was of considerable importance as a source of income on the general types of farms.

Livestock. The majority of the cattle kept in the area are cows kept for milk purposes. In the southern section of the area, where dairying is somewhat less intensive, the greater amount of pasture made the raising of beef, mainly coming from the dairy herds, of more importance than in the more northern sections. The total numbers of cattle have decreased in the area since 1900 because of the greater

concentration in dairy production. In 1929, 81% of all farms in the area reported cows kept for dairy purposes, with very few kept for beef purposes. The dual-purpose and nondescript types of dairy cattle have been replaced to a great extent by dairy cows of relatively good breeding, and the production of milk has increased greatly in the last 30 years.

This area is located within the Pennsylvania and Ohio fine-wool sheep area, and before the development of the dairy business, sheep were the most important livestock kept on farms. The demands for milk in the population centers in and near the area have made dairy cows more profitable users of available pastures, especially in the three northern counties of the area. In Marshall County, farther removed from central milk markets, sheep have remained a successful competitor for pasture land. The farmers reporting sheep in the area had a greater number per farm than any other area in the state in 1930, with the greatest numbers per farm in Brooke and Marshall Counties. Although the fine-wool type of sheep remains dominant, in recent years a tendency has been evident for the fine wools to be replaced by more of the mutton types, which give a more acceptable lamb for market.

Hogs were of commercial importance in the area in 1880, but their numbers have declined greatly, until at present they are raised mainly for home slaughter only.

The numbers of chickens in the area have increased steadily with the increase in available markets. In 1929, 17% of all the cash farm income was from the sale of eggs and poultry, and 76% of all eggs produced were sold. The bulk of the eggs sold are produced by farm flocks.

Sources of Income and Types of Farms. The sale of livestock products was 60% of the total cash farm income of the area, with the sale of livestock and crops 18% each. Dairy products were 64% of all livestock product sales; poultry and eggs, 28%; and wool, 8%. Variations from the average proportion of income from each source was small in the various counties. In the northern part of the area, apple sales were greater than in other sections, while in Marshall County, with more sheep, the livestock and wool sales were a little greater than average, with dairy products less.

Dairy Farms. Dairy farms were 18% of all farms and received 35% of all cash farm income of the area in 1929. Between 80 and 85% of this income was from the sale of whole milk; with crops about 7%; and livestock, 10%. In 1929 the average dairy farm had between 10 and 11 cows. Although dairy farms had only 46% of all milk cows in the area and produced 48% of all milk produced, they sold 84% of all milk sold as whole milk. With the limited crop acreage in the area, dairy farms raise their hay and roughage but purchase a high percentage of their concentrates.

General Farms. General farms were 32% of the total number of farms and received 32% of the total cash farm income in the area. About one-half their income was from the sale of livestock products,

30% from crops, and 17% from livestock. General farms in Marshall County had more livestock sales and less crop sales than that type in other sections. Dairy-products sales were in the form of butter and butterfat, with small quantities of whole milk. General farms kept about four milk cows per farm in 1929. The sale of eggs and poultry was an important source of income on general farms.

Self-Sufficing and Part-Time Farms. Self-sufficing and part-time farms were of importance in the area because of the opportunities for off-farm work in nearby cities. Their organizations were similar to the general farms, but their income from the sale of farm products was much less because of the smaller-sized farms doing a small volume of business.

Specialized Livestock Farms were found in greatest numbers in Marshall County, where commercial dairying is least important. The livestock farms were mainly those upon which large flocks of fine-wool sheep were the principal livestock kept.

The following records, one of a dairy farm and the other of a fine-wool sheep and dairy farm, will serve further to illustrate the type of farms in this area.

ORGANIZATION OF ONE DAIRY FARM IN OHIO COUNTY (AREA 12), 1934 (FARM "O")

Acres in Farm	124	*Investment in Farm*	$12,276
Crops	25	Land	8,000
Open pasture	90	Buildings	3,000
Woods pasture	4	Machinery and equipment	665
Farmstead, roads	5	Livestock	611

Crop Acres		*Production*	*Farm Use*	*For Sale*
Corn grain	4	120 bu.	120 bu.	.....
Corn silage	4	40 T.	40 T.	.....
Oat hay	4	3 T.	3 T.	.....
Alfalfa hay	8	20 T.	20 T.	.....
Clover hay	4	2 T.	2 T.	.....
Garden, etc.	1	.....	All	.....

Livestock Numbers				
Dairy cows	16	16 calves	.....	14 calves
		6,000 gal. milk	500 gal. milk	21,900 qts. milk
Calves	2	.....	.....	.....
Horses	2	.....	.....	.....
Chickens	50	30 chickens	30 chickens	.....
		300 doz. eggs	300 doz. eggs	.....

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 89	Calves 14 @ $5.50	$ 77
Feeds, 18 T.	504	Milk, 21,900 qt. @ 10c	2,190
Dairy supplies, hauling	150		
Other cash	77	Total	$2,267
Total	$820		

Cash receipts less cash expenses = $1,447.

Farm products used by family of 4: 30 chickens, 300 doz. eggs, 500 gal. milk, and vegetables from garden.

Dairy Farm "O" is typical of commercial dairy farms in Area 12 which are situated in the Ohio River Valley but have a limited acreage of river bottom lands. Only 24 acres of this farm are alluvial bottom land, which is used for crop land, the remainder being rolling to steep upland, too steep for cultivation. The limited crop land makes necessary the purchase of a large part of the grains for dairy feed. Alfalfa hay is successfully grown on the bottom land by lime and fertilizer treatment. The alfalfa land is broken only when the stand decreases, the remainder of the land having a rotation of corn, oats, and clover. The quality of the cows kept was not high, and were of mixed Jersey breeding with relatively low milk production per cow, the milk having a high butterfat content. Horses for farm work and a farm flock of poultry were the only other livestock kept.

This farm is also typical of the commercial dairy farms found along the Ohio River bottom in Area 9.

Whole milk sales, delivered retail to consumers in a city about one mile from the farm, provided the bulk of the receipts, calf sales being the only other source.

As on most commercial dairy farms, the farm products furnished towards family living were limited, the labor being occupied in the dairy business.

Dairy Farm "P" is typical of the farms still producing wool from fine-wool sheep. Usually these farms are located in areas somewhat removed from the local markets in a rough topography where the crop land is definitely limited and where pasture can be utilized best by sheep. This farm is 12 miles by dirt road to a paved highway, and 17 miles from any population center affording a market for fresh dairy products. Farms in this area having more and perhaps better crop land upon which to grow an adequate supply of feeds for winter, and having year-round roads near, have tended to replace the sheep and wool enterprise in recent years by the dairy enterprise, the more favorably located going into the whole-milk business.

On this farm wool is the principal source of income, with the sale of lambs and aged sheep in addition. The Delaine-Merino type of fine-wool sheep was kept, and the lambs were used as replacements in the ewe and wether flocks, the remainder being sold. This type of lamb does not make a good-quality butchering lamb, and the weights are relatively light compared to the mutton-type breeds. Wethers are kept for their wool production and may be kept one or more years while active feeders, depending upon mutton and wool prices and upon the supply of feed for wintering.

All field crops produced were fed to livestock, and except for a one-horse cultivator for corn, and a hay mower, all farm planting and harvesting was done by hand methods. The quality of dairy cows was low, and with better cows the dairy enterprise would have produced a greater income without increasing the feed expenses materially.

ORGANIZATION OF ONE FINE-WOOL SHEEP AND DAIRY FARM IN MARSHALL COUNTY (AREA 12), 1934 (FARM "P")

Acres in Farm	155	*Investment in Farm*	$7,452
Crops	25	Land	4,500
Open pasture	104	Buildings	2,000
Woods pasture	25	Machinery and equipment	115
Potatoes, garden	1	Livestock	837

Crop Acres	25	*Production*	*Farm Use*	*For Sale*
Corn	10	300 bu.	300 bu.	.....
Oats	4	100 bu.	100 bu.	.....
Wheat	4	52 bu.	52 bu.	.....
Mixed hay	6	10 T.	10 T.	.....
Garden, fruits	1	.....	.....	$35

Livestock Numbers				
Dairy cows	6	2100 gal. milk	1250 gal. milk	150 gal. cream
Bull	1	.....	.....	.....
Calves	3	.....	.....	3 calves
Horses	2	.....	.....	.....
Sow	1	12 pigs	4 hogs	8 hogs
Ewes	60	60 lambs	14 lambs	42 sheep
				875 lb. wool
Wethers	40		.....	.....
Chickens	40	150 chickens	50 chickens	100 chickens
		350 doz. eggs	140 doz. eggs	210 doz. eggs

Cash Expenses		*Cash Receipts*	
Taxes and insurance	$ 58	Lambs, wethers, ewes 42 @ $4	$ 168
Feeds, poultry, dairy 3 T.	76	Wool 875 lb. @ 26c	228
Fertilizer	6	Calves 3 @ $7	21
Labor, day	10	Hogs 8 @ $6.50	52
Other cash	62	Cream 150 gal. @ 80c	120
		Chickens 100 @ 60c	60
Total	$212	Eggs 210 doz. @ 18c	38
		Vegetables, small fruits	35
		Total	$722

Cash receipts less cash expenses = $510.

Farm products used by family of 9: 2 bu. corn for meal, 40 bu. potatoes, 600 lb. dressed pork, 350 lb. dressed lamb, 50 chickens, 750 gal. milk, 210 lb. butter, 140 doz. eggs, vegetables from garden, small fruits, apples and peaches.

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